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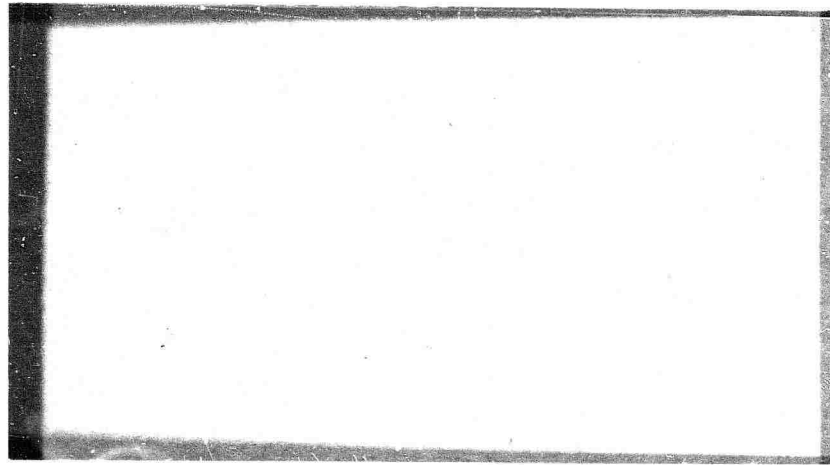
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~~TEST PLAN~~

REPORT E217

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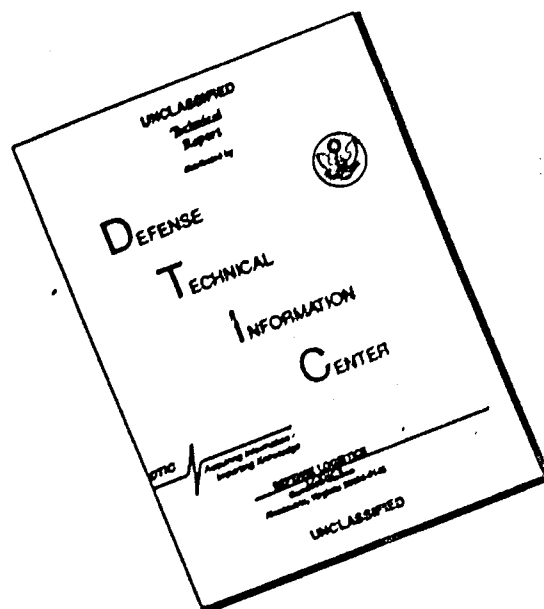
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PREFACE

THE SPACECRAFT SYSTEMS TEST (SST) PLAN AS OUTLINED IN THIS REPORT CONSTITUTES THE ACCEPTANCE TEST PLAN FOR THE GEMINI B SPACECRAFT UTILIZED IN THE MOL PROGRAM. THIS PLAN IS PREPARED IN ACCORDANCE WITH LINE ITEM 20T OF THE CONTRACT DATA REQUIREMENTS LIST (CDRL) AND AFLC/AFSC FORM 9(U)T-208 UNDER CONTRACT F04695-67-C-0023, GEMINI B ACQUISITION PROGRAM.

THIS REPORT IS PREPARED IN TWO SECTIONS: SECTION I OUTLINES THE OVERALL TESTING PLAN ON GEMINI B SPACECRAFT AND SECTION II PROVIDES A BRIEF OUTLINE OF EACH TEST.

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LIST OF ABBREVIATIONS

ACE	ATTITUDE CONTROL ELECTRONICS
ACEG	ATTITUDE CONTROL ELECTRONICS GROUP
ACSE	ATTITUDE CONTROL SYSTEM ELECTRONICS
ACTS	ATTITUDE CONTROL THRUSTER SYSTEM
ACPU	AUXILIARY COMPUTER POWER UNIT
ADAPT	ADAPTER
AGE	AEROSPACE GROUND EQUIPMENT
ASSY	ASSEMBLY
ASTRO	ASTRONAUT
ATM	AUXILIARY TAPE MEMORY
ATT	ATTITUDE
AVE	AEROSPACE VEHICLE EQUIPMENT
BATT	BATTERY
BCN	BEACON
BEF	BLUNT END FORWARD
CAL	CALIBRATION
CDDS	COMPUTER DATA DISPLAY SYSTEM
CDRL	CONTRACT DATA REQUIREMENTS LIST
c.g.	CENTER OF GRAVITY
CKTS	CIRCUITS
CMD	COMMAND
CNTL	CONTROL
C/O	CHECKOUT
COMM	COMMUNICATION

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MODEL 195BLIST OF ABBREVIATIONS (CONTINUED)

COND	CONDUCTOR
CTUM	CREW TRANSFER UMBILICAL
DAS	DATA ACQUISITION SYSTEM
ECS	ENVIRONMENTAL CONTROL SYSTEM
EFC	EQUIPMENT FUNCTIONAL CHECKS
EMER	EMERGENCY
EMI	ELECTRO-MAGNETIC INTERFERENCE
EVA	EXTRA-VEHICULAR ACTIVITY
EXT	EXTERNAL
FDI	FLIGHT DIRECTOR INDICATOR
F/M, FM	FREQUENCY MODULATION
GBQ	GEMINI B QUALIFICATION
G & C	GUIDANCE AND CONTROL
GIA	GUIDANCE INTERFACE ADAPTER
GOX	GASEOUS OXYGEN
GSO	GROUND SYSTEMS OPERATIONS
H/CNTL	HAND CONTROLLER
HESS	HIGH ENERGY SQUIB SIMULATOR
HF	HIGH FREQUENCY
HF/DF	HIGH FREQUENCY/DIRECTION FINDER
HX	HEAT EXCHANGER
Hz	HERTZ
IGS	INERTIAL GUIDANCE SYSTEM
IMU	INERTIAL MEASURING UNIT

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LIST OF ABBREVIATIONS (CONTINUED)

INSTR	INSTRUMENTATION
IVI	INCREMENTAL VELOCITY INDICATOR
J/B	JUNCTION BOX
KBPS	KILO-BITS PER SECOND
L/H	LEFT HAND
LICH	LITHIUM HYDROXIDE
LP	LOW PRESSURE
LTS	LIGHTS
LV/L	LAUNCH VEHICLE/LABORATORY
MDIU	MANUAL DATA INPUT UNIT
MED	MEDICAL
MIC	MICROPHONE
MOL	MANNED ORBITING LABORATORY
MOL/LV	MANNED ORBITING LABORATORY/LAUNCH VEHICLE
MON	MONITOR
PACS	PAD ABORT CONTROL SYSTEM
PATE	PAD ABORT THRUSTER ELECTRONICS
PCM	PULSE-CODE-MODULATION
PRESS	PRESSURE
PRF	PULSE RATE FREQUENCY
PSA	PRESSURE SUIT ASSEMBLY
PWR	POWER
QUAL	QUALIFICATION
RCS	RE-ENTRY CONTROL SYSTEM

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MODEL 195BLIST OF ABBREVIATIONS (CONTINUED)

RCVR	RECEIVER
REFRIG	REFRIGERATION
REG	REGULATOR
RF	RADIO FREQUENCY
R/H	RIGHT HAND
RMS	ROOT MEAN SQUARE
S/C	SPACECRAFT
SCD	SPECIFICATION CONTROL DRAWING
SEF	SMALL END FORWARD
SEP	SEPARATE
SEQ	SEQUENTIAL
SGLS	SPACE GROUND LINK SYSTEM
SIM	SIMULATOR
SPL	SOUND PRESSURE LEVEL
SST	SPACECRAFT SYSTEMS TEST
STA	STATION
STE/STC	SPACECRAFT TEST ENGINEER/SPACECRAFT TEST CONDUCTOR
STDR	SPACE TECHNICAL DATA REPORT
SW	SWITCH
SWR	STANDING WAVE RATIO
SYS	SYSTEM
T-C	THERMOCOUPLE
TCA	THRUST CHAMBER ASSEMBLY
TM	TELEMETRY

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LIST OF ABBREVIATIONS (CONTINUED)

T/P	TEST POINT
TQT	THERMAL QUALIFICATION TEST
T/R	TAPE RECORDER
T/R	TRANSMITTER-RECEIVER
TRS	TIME REFERENCE SYSTEM
UHF	ULTRA-HIGH FREQUENCY
UMB	UMBILICAL
VCO	VOLTAGE CONTROLLED OSCILLATOR
VHF	VERY HIGH FREQUENCY
VOM	VOLT-OHM-METER
VOX	VOICE OPERATED TRANSMITTER KEYS
VSWR	VOLTAGE STANDING WAVE RATIO
W/B	WIRE BUNDLE
XMTR	TRANSMITTER

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1.0 SPACECRAFT SYSTEMS TEST PLAN

1.1 SCOPE

THIS DOCUMENT OUTLINES THE TEST PLAN TO BE CONDUCTED ON GEMINI "B" SPACECRAFT AT THE MCDONNELL ST. LOUIS FACILITY PRIOR TO TENDERING THE SPACECRAFT TO THE U.S. AIR FORCE FOR ACCEPTANCE.

FROM THIS PLAN WILL EVOLVE THE DETAILED TEST PROCEDURES PREPARED IN ACCORDANCE WITH THE MASTER SCHEDULE WHICH DEPICTS VEHICLE FLOW. SPACECRAFT SYSTEMS TEST (SST) ENCOMPASS THOSE TESTS WHICH HAVE BEEN IDENTIFIED OR KNOWN AT VARIOUS TIMES AS FACTORY CHECKOUT, INTEGRATED OR COMBINED SYSTEM TESTS, MANUFACTURING ACCEPTANCE OR SPACECRAFT ACCEPTANCE TESTS. THESE TESTS ARE CONDUCTED DURING OR AFTER MANUFACTURING BUT PRIOR TO DELIVERY OF THE SPACECRAFT FROM THE MCDONNELL ST. LOUIS FACILITY.

THE TEST OUTLINES PRESENTED IN SECTION II ARE BASED ON A MANNED VEHICLE CONFIGURATION. SINCE MOST OF THE SYSTEM TESTS ARE EITHER THE SAME OR SLIGHTLY MODIFIED BETWEEN MANNED AND UNMANNED VEHICLES, ONLY THE MOST SIGNIFICANT TEST DIFFERENCES ARE IDENTIFIED (SIGNIFICANT IS DEFINED AS THOSE SYSTEMS AND COMPONENTS IDENTIFIED IN SECTION II). ANTICIPATED TEST FLOW FOR GEMINI "B" SPACECRAFT AVE #1 THROUGH #4 IS DEPICTED IN SECTION II, FIGURES 2-1 AND 2-2.

1.1.1 BACKGROUND

THE SST PLAN PROPOSED FOR GEMINI B SPACECRAFT IS ESSENTIALLY THE SAME SST PLAN THAT EVOLVED ON THE NASA GEMINI PROGRAM. THE TEST FLOW RESULTS IN A METHODOICAL BUILD-UP OF MODULES INTO A MATED SPACECRAFT AND FROM THEN ON, THE TEST FLOW IS GEARED TO THE NEED OF HAVING SYSTEMS READY FOR SIMULATED

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1.1.1 BACKGROUND (CONTINUED)

FLIGHT TESTING. THE ALTITUDE CHAMBER TESTING IS SCHEDULED LAST IN ORDER TO HAVE MAXIMUM CONFIDENCE IN OVERALL SPACECRAFT SYSTEMS PRIOR TO PUTTING A MAN IN THE SPACECRAFT AT ALTITUDE.

1.2 TEST PHILOSOPHY

THE TOTAL SYSTEMS TEST CONCEPT COVERING THE TIME FROM MANUFACTURING COMPLETION THROUGH THE LAUNCH OF A SPACECRAFT HAS EVOLVED THROUGH TWO MANNED SPACECRAFT PROGRAMS: NASA MERCURY AND GEMINI. THE RESULTING EVOLUTION NOW PERMITS THE CARRYING OUT OF AN EFFICIENT STREAMLINED PROGRAM WHOSE UNDERLYING PHILOSOPHY IS THAT EACH SPACECRAFT IS ESSENTIALLY FLIGHT READY WHEN IT LEAVES THE MCDONNELL ST. LOUIS FACILITY.

1.2.1 GENERAL

TESTING OF COMPONENTS OR EQUIPMENT PRIOR TO INSTALLATION IN THE SPACECRAFT OR ITS MODULAR SECTIONS IS BASED ON THE GOVERNING PHILOSOPHY THAT THE SUPPLIER OR VENDOR CONDUCTS VALID AND COMPREHENSIVE TESTS IN ACCORDANCE WITH THE SPECIFICATION CONTROL DRAWING (SCD). HOWEVER, THERE ARE INSTANCES WHERE RE-TEST OF EQUIPMENT AT THE MCDONNELL FACILITY PRIOR TO INSTALLATION IS JUSTIFIED. THIS TESTING HAS BEEN IDENTIFIED AS EQUIPMENT FUNCTIONAL CHECKS (EFC). THE JUSTIFICATION FOR EFC IS BASED ON THE FOLLOWING CONSIDERATIONS.

- (A) SUFFICIENT HISTORICAL TEST DATA EXISTS THAT INDICATES A SUFFICIENT NUMBER OF DEFICIENCIES ARE BEING UNCOVERED BY VARIOUS TESTING PROGRAMS ON SPECIFIC PIECES OF EQUIPMENT THAT JUSTIFIES SPECIAL TESTING PRIOR TO INSTALLATION.

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- (B) BECAUSE CERTAIN EQUIPMENT IS NEW FOR THE GEMINI B PROGRAM, ADDITIONAL TESTING PRIOR TO INSTALLATION IS JUSTIFIED UNTIL SUFFICIENT TEST DATA IS AVAILABLE TO DETECT ANY TRENDS.
- (C) AN EVALUATION OF THE TRADE-OFF IN TERMS OF COST BETWEEN FINDING AND FIXING A DISCREPANT CONDITION AT THE MODULE LEVEL AS OPPOSED TO FINDING AND FIXING THIS CONDITION AFTER INSTALLATION, JUSTIFIES EFC ON THIS PIECE OF EQUIPMENT.
- (D) IT IS EQUIPMENT FABRICATED IN THE CONTRACTOR FACILITY AND EFC CONSTITUTES THE FINAL MANUFACTURING ACCEPTANCE TEST.
- (E) RE-VERIFICATION OF "SUSPECT" EQUIPMENT UNCOVERED DURING SYSTEM TESTS WILL BE BY MEANS OF EFC.

IT IS INTENDED, HOWEVER, TO PROVIDE THE CAPABILITY IN TERMS OF AGE AND TEST PROCEDURES TO CONDUCT EFC ON A RATHER EXTENSIVE LIST OF EQUIPMENT IN ORDER TO FACILITATE TROUBLESHOOTING AND TO PRECLUDE SCHEDULE DELAYS DUE TO CYCLING EQUIPMENT BACK TO THE VENDOR.

THE PROPOSED SST PLAN IS BASED UPON THE ASSUMPTION THAT A SPACECRAFT MODULE HAS COMPLETED MANUFACTURING WHEN SST IS BEGUN.

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1.2.1 GENERAL (CONTINUED)

EXPERIENCE HAS SHOWN THAT COST AND SCHEDULE CONSIDERATIONS SOMETIMES DICTATE A LESSER POSITION IN THIS MATTER. CRITERIA GOVERNING ACCEPTANCE OF THESE MODULES INTO TEST (SST) ARE DISCUSSED IN OP-101.

1.2.2 SAFETY/MANNED TEST

THE SAFETY PHILOSOPHY TO BE IMPLEMENTED BY THE CONTRACTOR DURING THE MANNED ALTITUDE CHAMBER TEST PORTIONS OF ACCEPTANCE TESTING HAS BEEN DEVELOPED AND REFINED OVER A PERIOD OF YEARS AND THRU SEVERAL SUCCESSFUL PROGRAMS.

THIS PHILOSOPHY REQUIRES THAT THE NORMAL CORPORATE DEPARTMENTS CONCERNED WITH SAFETY IN MANNED TESTING PROVIDE SAFETY CRITERIA AND SUPPORT IN THE PREPARATION, REVIEW AND CONDUCT OF MANNED TESTING IN THE ALTITUDE CHAMBER. THE ACTIVITY OF THESE DEPARTMENTS WILL BE MONITORED BY THE PROJECT SAFETY MANAGER. IN ESSENCE THIS PHILOSOPHY REQUIRES THE FOLLOWING ACTIONS:

- (A) REVIEW OF ADEQUACY OF FACILITIES, EQUIPMENT AND TEST VEHICLE PRIOR TO TESTING.
- (B) TRAINED RESCUE, FIREFIGHTING AND TEST PERSONNEL.
- (C) PHYSICAL AND MENTAL CERTIFICATION OF TEST SUBJECTS BY MEDICAL PERSONNEL.
- (D) QUALIFIED MEDICAL PERSONNEL ON DUTY DURING MANNED TESTING.
- (E) INSTRUMENTATION OF TEST SUBJECTS TO MEASURE THEIR PHYSIOLOGICAL CONDITION.
- (F) DETAIL TEST AND CHECKOUT PROCEDURES. THESE PROCEDURES WILL COVER EMERGENCY CONDITIONS.

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1.2.2 SAFETY/MANNED TEST (CONTINUED)

- (G) DRY RUNS PRIOR TO PUTTING MAN IN LOOP.
- (H) INCLUSION OF SAFETY OFFICER AND AEROSPACE MEDICAL OFFICER IN TEST TEAM.

1.2.3 TESTING GROUND RULES

THE FOLLOWING BASIC GROUND RULES HAVE BEEN UTILIZED IN THE PREPARATION OF THE SST PLAN:

- (A) CONTRACT END ITEM SPECIFICATIONS AND INTERFACE SPECIFICATIONS SHALL BE REVIEWED FOR TEST REQUIREMENTS IN ORDER TO ASSURE THAT AS A MINIMUM THESE REQUIREMENTS ARE VERIFIED.
- (B) DURING TEST SEQUENCES, CRITICAL PARAMETERS SHALL BE EVALUATED AGAINST PERFORMANCE SPECIFICATIONS THAT ARE REQUIRED TO PERFORM A SUCCESSFUL MISSION. ALL SPACECRAFT SYSTEMS SHALL DEMONSTRATE PERFORMANCE EQUAL TO OR ABOVE THE MINIMUM SPECIFICATION LEVEL IN ORDER TO BE CONSIDERED FLIGHT WORTHY. NO SUBSYSTEM OR SYSTEM ENCOUNTERING A MALFUNCTION SHALL BE CONSIDERED FLIGHT WORTHY UNTIL SAID MALFUNCTION IS CORRECTED OR SATISFACTORILY EXPLAINED AND ACCEPTED.
- (C) THE FUNCTIONAL TEST MUST NOT INTRODUCE INPUT, SWITCHING, PSEUDO OPERATION, LOADING, ETC., WHICH MAY COMPROMISE EQUIPMENT PERFORMANCE OR PREVIOUS TEST RESULTS. THE TESTS MUST NOT HAVE ANY ADVERSE EFFECTS ON THE SYSTEM WHICH WOULD DEGRADE FLIGHT PERFORMANCE.
- (D) FUNCTIONAL TESTS WILL BE PERFORMED AFTER THE EQUIPMENT IS IN FLIGHT READY CONFIGURATION *INsofar AS IS PRACTICAL) AND WILL BE APPROPRIATELY REVERIFIED IF THE EQUIPMENT OR

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MODEL 195B**1.2.3 TESTING GROUND RULES (CONTINUED)****(D) (CONTINUED)**

OVERALL SPACECRAFT CONFIGURATION IS SUBSEQUENTLY CHANGED, MODIFIED, OR EXPANDED.

(E) DURING SIMULATED FLIGHT PHASES OF THE TEST PROGRAM, EACH SUBSYSTEM WILL BE SUBJECTED TO CONDITIONS AND OPERATIONS APPROXIMATING, INSOFAR AS PRACTICAL, ACTUAL FLIGHT PROCEDURES INCLUDING REPRESENTATIVE ABORT CONDITIONS.

(F) ALL EQUIPMENT INTERFACES MUST BE EXERCISED. EQUIPMENT REMOVAL FOR TEST PURPOSES SHALL BE HELD TO A MINIMUM.

(G) DUPLICATION OF TESTING SHALL BE MINIMIZED.

(H) EQUIPMENT OPERATING TIME FOR TEST PURPOSES SHALL BE MINIMIZED AND FOR LIFE LIMITED COMPONENTS WILL BE RECORDED.

(I) THE TEST COMPLEX, WITH ALL AGE REQUIRED, SHALL BE VALIDATED PRIOR TO MATING WITH THE SPACECRAFT. (NOTE 1)

NOTE (1) "TEST COMPLEX" REFERS TO THAT LOCATION IN THE CONTRACTOR'S PLANT WHERE ELECTRICAL AND MECHANICAL AGE ARE ASSOCIATED IN ONE AREA AND THROUGH A NETWORK OF CABLES, JUNCTION BOXES AND PATCH-BOARDS ARE CONNECTED TO A SPACECRAFT TO EFFECT CHECKOUT.

(J) ALL TESTING SHALL BE CONDUCTED IN CONFORMANCE WITH WRITTEN TEST PROCEDURES. IN THE EVENT "TROUBLESHOOTING" IS REQUIRED, THE SYSTEMS ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING SPECIAL SET-UPS THAT MAY DEVIATE

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1.2.3 TESTING GROUND RULES (CONTINUED)

(J) (CONTINUED)

FROM THE WRITTEN PROCEDURE AND SHALL ALSO BE RESPONSIBLE FOR RETURNING THE TEST COMPLEX AND THE SPACECRAFT TO ITS ORIGINAL OR AN ACCEPTABLE CONDITION WHEN TROUBLE ISOLATION AND CORRECTIVE ACTION ARE COMPLETED. SPECIAL TEST SET-UPS AND PROCEDURES FOR "TROUBLESHOOTING" OPERATIONS SHALL BE DOCUMENTED.

(K) THE ACCEPTANCE TEST PROCEDURES (STDRS), AS A MINIMUM, SHALL PROVIDE FOR THE RECORDING OF DATA REQUIRED TO VERIFY TEST REQUIREMENTS ACQUIRED FROM PARAGRAPH (A). THE STDR'S SHALL IDENTIFY THE RECORDING TECHNIQUE (I.E., TRACES, DIGITAL DISPLAYS, ETC.).

(L) IF A VEHICLE COMPONENT IS TO BE MODIFIED, REPLACED AND/OR RETESTED AS A RESULT OF SPACECRAFT ACCEPTANCE TEAM ACTIVITIES, RE-TEST PLANS SHALL BE PREPARED AND SUBMITTED TO SPACECRAFT ACCEPTANCE TEAM FOR REVIEW AND APPROVAL.

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1.3 SYSTEMS TEST ORGANIZATION

FIGURE 1-1 DEPICTS THE LINE ORGANIZATION FROM THE PRESIDENT TO THE MANAGER OF VEHICLE TESTS & OPERATIONS WHO HAS THE DIRECT RESPONSIBILITY FOR CHECKING-OUT AND CONDUCTING SYSTEMS TESTS ON SPACECRAFT PRIOR TO DELIVERY FROM ST. LOUIS. THIS GROUP IS KNOWN AS THE GROUND SYSTEMS OPERATIONS (GSO) GROUP.

FUNCTIONAL TEST ORGANIZATION DIAGRAM

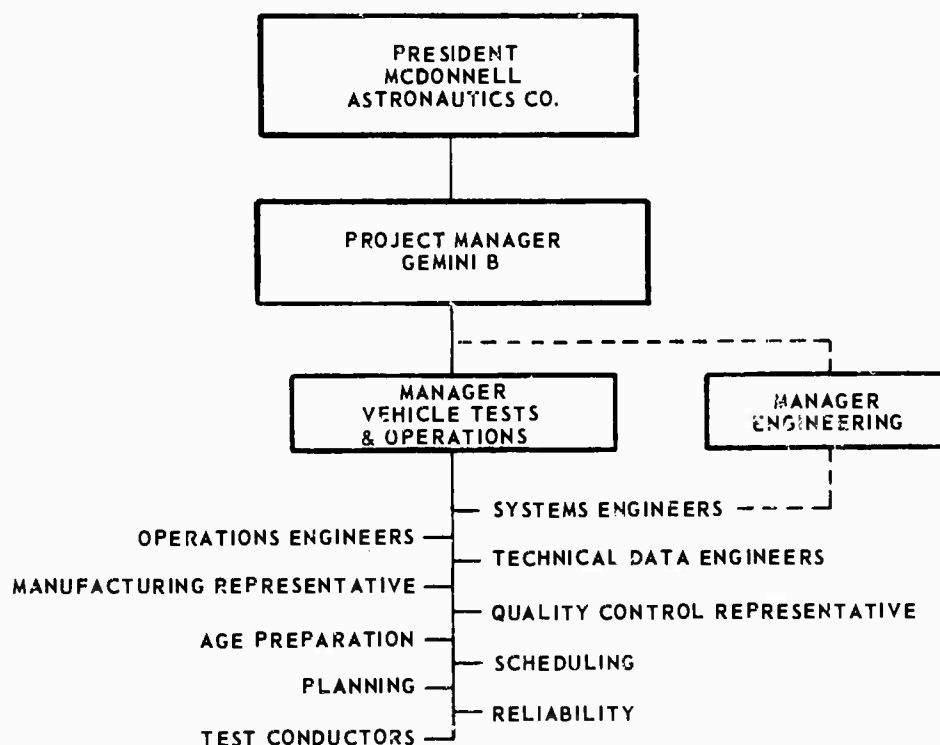


FIGURE 1-1

THE OPERATIONS GROUP (GSO) IS COMPOSED OF ELEMENTS OF THE DEPARTMENTS THAT PRODUCE THE SPACECRAFT. THE ORGANIZATIONAL STRUCTURE OF GSO IS GEARED TO CONTINUOUSLY EXPEDITE THE PROGRESS OF SPACECRAFT THROUGH SST. FOR HIGH RESPONSE TO ELIMINATING ANY DELAY THAT MAY BE ENCOUNTERED, AUTHORITY IS PRESENT WITHIN GSO TO PERFORM MOST COMPANY

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1.3 SYSTEMS TEST ORGANIZATION (CONTINUED)

FUNCTIONS ON IMMEDIATE VEHICLES. ACCESS TO DEPARTMENTS IN THE DIVISION IS AFFORDED THE OPERATIONS GROUP FOR ACTION WHERE TIME PERMITS AND FORMAL PATHS FOR EXPERIENCE FEEDBACK ARE ARRANGED. A DESCRIPTION OF THE FUNCTIONS UNDER THE MANAGER OF OPERATIONS IS GIVEN BELOW.

SYSTEMS ENGINEERS -	ENGINEERING PERSONNEL WHO DEFINE SPACECRAFT TEST REQUIREMENTS, STAFF THE TEST TEAM, DEFINE ANOMALY INVESTIGATION, DISPOSITION NON-CONFORMITIES, AND SUPPORT AGE PREPARATION.
OPERATIONS ENGINEERS -	PERSONNEL RESPONSIBLE FOR CONTROLLING AND COORDINATING THE PLANNED ACTIVITY ON THE SPACECRAFT WHILE UNDER GSO CONTROL.
TECHNICAL DATA ENGINEERS -	SPECIALISTS IN WRITING DETAIL TEST PROCEDURES WHO WORK CLOSELY WITH THE SYSTEMS ENGINEERS.
MANUFACTURING -	PROVIDES REPRESENTATIVES TO THE OPERATIONS GROUP TO CONVEY SPACECRAFT STATUS, TIME ESTIMATES TO ACCOMPLISH SPECIFIC TASKS, ESTABLISH AVAILABILITY OF SPACECRAFT EQUIPMENT AND SUPPORT TESTING.

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1.3 SYSTEMS TEST ORGANIZATION (CONTINUED)

QUALITY CONTROL -

PROVIDES REPRESENTATIVES TO THE OPERATIONS GROUP TO COORDINATE QUALITY CONTROL TASKS AND TO PROVIDE A RAPID RESPONSE TIE TO THEIR FUNCTIONAL DEPARTMENT.

AGE PREPARATION FUNCTION -

PROVIDES REVIEW OF AGE ENGINEERING DOCUMENTATION AND COORDINATES THE MOST EFFICIENT TIME OF INCORPORATION. THEY PROMOTE EFFICIENT TIMING OF CALIBRATION AND MAINTENANCE EXERCISES TO ASSURE AVAILABILITY OF AGE FOR TESTING.

SCHEDULING FUNCTION -

SUPPORTS THE OPERATIONS PLANNING TASK BY ESTIMATING MANHOURS REQUIRED TO ACCOMPLISH MANUFACTURING TASK AND PROVIDE FEEDBACK OF HOURS EXPENDED VERSUS HOURS PLANNED. THEY ARE THE FORMAL CONTACT TO THE FABRICATION AND ASSEMBLY FUNCTIONAL PLANNING GROUP AND THROUGH THIS ACCESS PROVIDE ADVANCE INFORMATION ON FORTHCOMING ENGINEERING CHANGES.

ADMINISTRATION AND PLANNING FUNCTION

- PROVIDE ADMINISTRATIVE SUPPORT TO MONITOR MANPOWER, BUDGETS, ETC., AND THE REPORTING OF THESE ITEMS. IT PREPARES THE GSO WORK PLANS FOR EACH SPACECRAFT IN SST AND COORDINATES OTHER DIVISIONS SUPPORT.

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1.3 SYSTEMS TEST ORGANIZATION (CONTINUED)

RELIABILITY FUNCTION - PROVIDE PERSONNEL THAT FOLLOW TESTING AND ASSURE PROPER DOCUMENTATION OF MALFUNCTIONS AND PROVIDE INFORMATION TO THE RELIABILITY DEPARTMENT TO SUPPORT RELIABILITY ANALYSIS.

TEST CONDUCTORS - RESPONSIBLE ENGINEERS WHO DIRECT AND CONTROL THE ACTUAL TESTING ON THE SPACECRAFT AND CONSTITUTE THE CENTRAL AUTHORITY THROUGH WHICH ALL ACTIVITY MUST BE COORDINATED WHEN A SPACECRAFT IS IN A TEST PERIOD.

VEHICLE TESTS & OPERATIONS MANAGER AN EXPERIENCED TEST MANAGER WHO IS RESPONSIBLE FOR THE TOTAL ACCEPTANCE TEST EFFORT. HE IS RESPONSIBLE TO THE PROGRAM MANAGER FOR ACCEPTABLE TEST ACTIVITIES. HE WILL ALSO PROVIDE THE NECESSARY COORDINATION BETWEEN THE ACCEPTANCE TEST AREA AND THE LAUNCH SITE.

1.4 OPERATIONAL GROUND RULES FOR CONDUCT OF ACCEPTANCE TESTING

CONDUCT OF ACCEPTANCE TEST SHALL BE AS DEFINED IN SASFL 22015.
THE WORKING RELATIONSHIP BETWEEN THE LOCAL GOVERNMENT REPRESENTATIVE AND THE

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1.4 OPERATIONAL GROUND RULES FOR CONDUCT OF ACCEPTANCE TESTING (CONTINUED)

SENTATIVE AND MDAC-ED DURING ACCEPTANCE TESTING SHALL BE
AS DEFINED IN OP-101.

1.5 TRAINING OF TEST PERSONNEL

TRAINING OF THE TEST PERSONNEL IS ESSENTIALLY ACCOMPLISHED ON THE
JOB AND COVERS MANY PHASES ENCOMPASSING LONG PERIODS OF TIME.
BEFORE A MAN REACHES THE POINT WHEREBY HE MAY BE CONSIDERED A
TRAINED TEST ENGINEER, HE WILL HAVE HAD SOME OF THE FOLLOWING
EXPERIENCES:

- (A) EXPERIENCE IN WORKING ON THE DETAIL DESIGN OF THE SPACECRAFT,
ITS SYSTEMS AND AGE.
- (B) EXPERIENCE GAINED BY WORKING ON THE DEVELOPMENT AND QUALIFI-
CATION TESTING OF THE VARIOUS COMPONENTS AND SYSTEMS OF THE
SPACECRAFT.
- (C) EXPERIENCE GAINED BY BEING A TEST ENGINEER ON PREVIOUS OR
SIMILAR PROGRAMS.
- (D) EXPERIENCE GAINED BY REVIEWING AND APPROVING THE TEST PROCEDURES.
- (E) EXPERIENCE GAINED BY CONDUCTING, OR SUPPORTING EQUIPMENT
TESTING PRIOR TO ITS INSTALLATION IN SPACECRAFT. THE SIMILARITY
BETWEEN THE GEMINI B AND THE NASA GEMINI PROGRAMS PROVIDES A
TRAINED **NUCLEUS** OF TEST PERSONNEL FROM THE NASA GEMINI PROGRAM
WHICH IS AVAILABLE FOR GEMINI B.

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1.6 TEST MILESTONE AND SCHEDULES

THE TEST MILESTONES AND THE ANTICIPATED SPACECRAFT SCHEDULES ARE DEPICTED ON FIGURES 1-2 AND 1-3. FIGURE 1-2 PRESENTS A SERIES OF MILESTONES THAT ARE REPRESENTATIVE OF THE MILESTONE FOR EACH SPACECRAFT TEST. FIGURE 1-3 SHOWS THE TEST SCHEDULE RELATIONSHIP OF EACH SPACECRAFT WHILE IN SPACECRAFT SYSTEMS TEST.

1.7 ACTIVITIES FOLLOWING ACCEPTANCE OF SPACECRAFT TESTING

THE CONTRACTOR AND THE CUSTOMERS REPRESENTATIVES SHALL WORK TOGETHER ON THE ACTIVITIES THAT TAKE PLACE FOLLOWING THE COMPLETION OF SPACECRAFT ACCEPTANCE TESTING. SOME OF THE ACTIVITIES THAT TAKE PLACE ARE AS FOLLOWS:

- (A) START PREPARATION FOR SHIPMENT.
- (B) CLEAN-UP SPACECRAFT DISCREPANCIES REPORTS.
- (C) CLEAN-UP OPEN PLANNING.
- (D) FETEST INDIVIDUAL COMPONENTS (AS REQUIRED).

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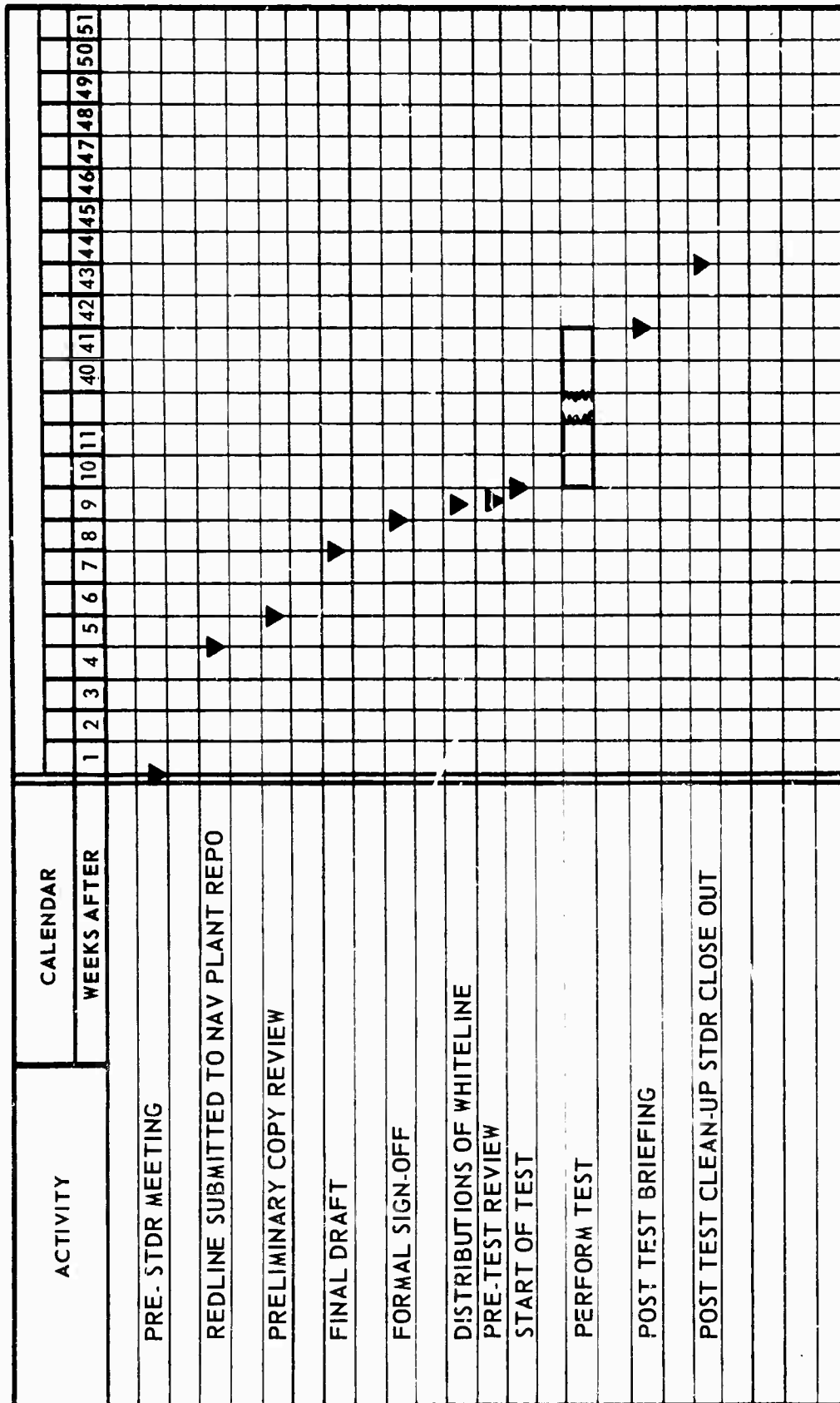


FIGURE 1-2 TEST MILESTONES (TYPICAL AVE 3 & 4)

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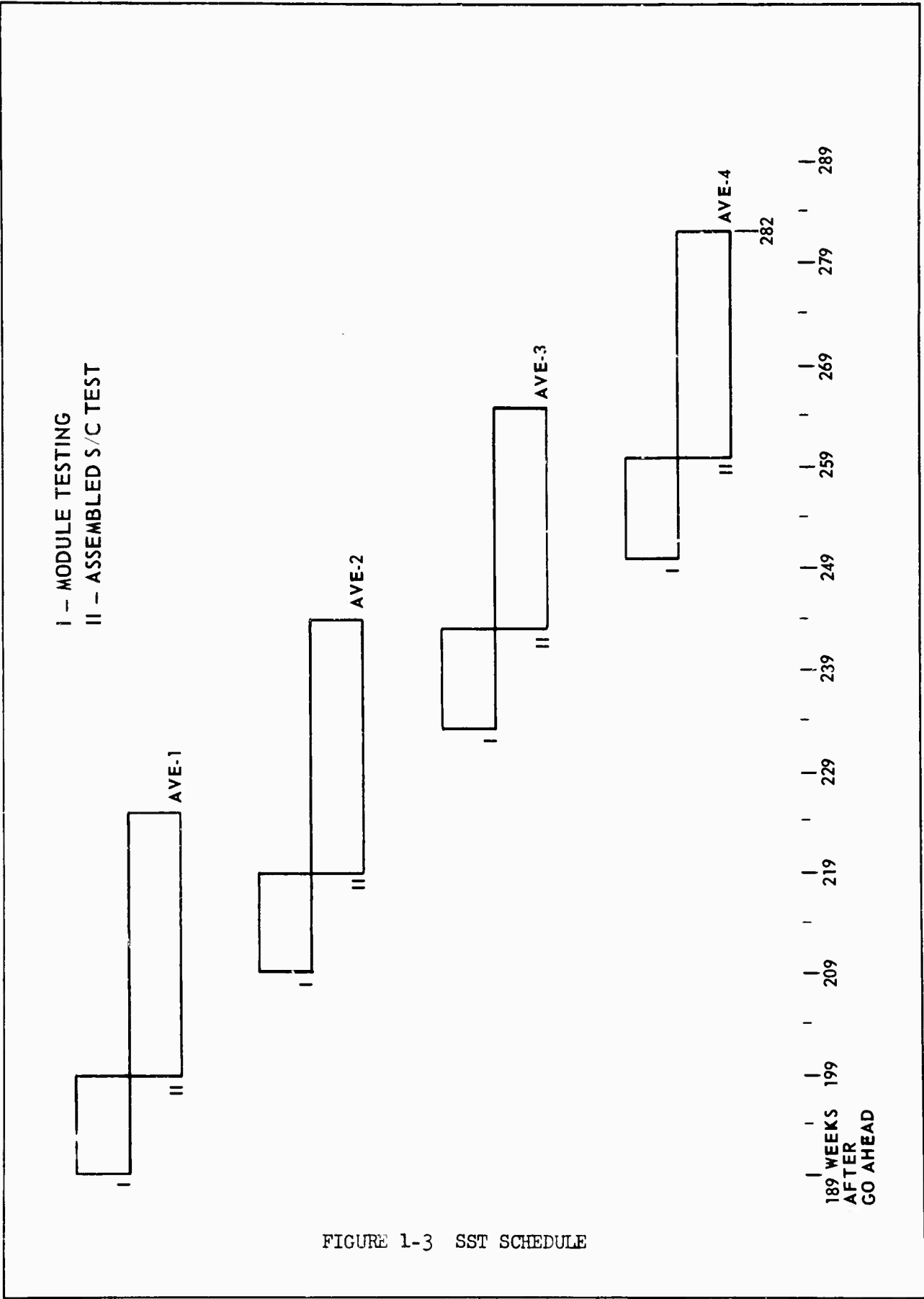
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SECTION II

SPACECRAFT SYSTEM TEST (SST)

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2.0 SPACECRAFT SYSTEMS TEST OUTLINES (SST)

2.1 INTRODUCTION

THE TESTS IDENTIFIED IN THIS SECTION ARE CONDUCTED PRIOR TO DELIVERY OF THE SPACECRAFT FROM THE MCDONNELL ST. LOUIS FACILITY. THE LEVEL OF INFORMATION PRESENTED IS FOR PLANNING PURPOSES ONLY. FROM THESE OUTLINES, DETAILED TEST PROCEDURES WILL BE PREPARED.

TEST OBJECTIVES, SPACECRAFT CONFIGURATION AND TEST OUTLINES ARE PROVIDED FOR THE PROPOSED TESTS. THE TEST FLOW OR SEQUENCE IS THE PRESENTLY KNOWN PLAN AND IS SUBJECT TO CHANGE AS THE DETAIL TEST PLANS ARE FORMULATED. TEST CONFIGURATION OF THE TEST FACILITIES AND THE ARTICLE UNDER ACCEPTANCE TEST SHALL BE STRICTLY CONTROLLED AT ALL TIMES. THE ARTICLE UNDER TEST SHALL REMAIN IN THE CONFIGURATION AT THE COMPLETION OF THE TEST UNTIL NAVPLANTREPO APPROVAL HAS BEEN GIVEN TO PROCEED TO THE NEXT PLANNED ACTIVITY.

THE ANTICIPATED REPRESENTATIVE TEST FLOW FOR THE GEMINI B FLIGHT CONFIGURATIONS (GBQ AND MANNED) ARE DEPICTED ON FIGURES 2-1 AND 2-2. THE DIFFERENCES BETWEEN THE GBQ AND MANNED TEST FLOWS IS BECAUSE OF THE REQUIREMENT TO PERFORM A VIBRATION TEST ON GBQ. THE DIFFERENCES IN THE TEST FLOWS OCCUR AFTER SYSTEM ASSURANCE TESTING. THE FLOW IS ARRANGED TO ALLOW AN ABBREVIATED SYSTEM ASSURANCE TEST DURING SIMULATED FLIGHT FOLLOWING THE VIBRATION TEST WITH A MINIMUM NUMBER OF MOVES BETWEEN TEST FACILITIES. THIS TEST SEQUENCE AND THE TEST OUTLINES DESCRIBED LATER REPRESENT CURRENT PLANNING AND ARE SUBJECT TO CHANGE WHEN THE ACTUAL PLAN IS EXECUTED. THIS FLEXIBILITY MUST BE PRESENT IN ANY TEST PLAN TO FACILITATE ITS EXPEDIENT EXECUTION WHILE AT THE SAME TIME MEETING BOTH THE INDIVIDUAL TEST AND THE OVERALL PROGRAM OBJECTIVES. CHANGES TO THE APPROVED TEST FLOW SHALL BE CONTROLLED IN ACCORDANCE WITH OP-101.

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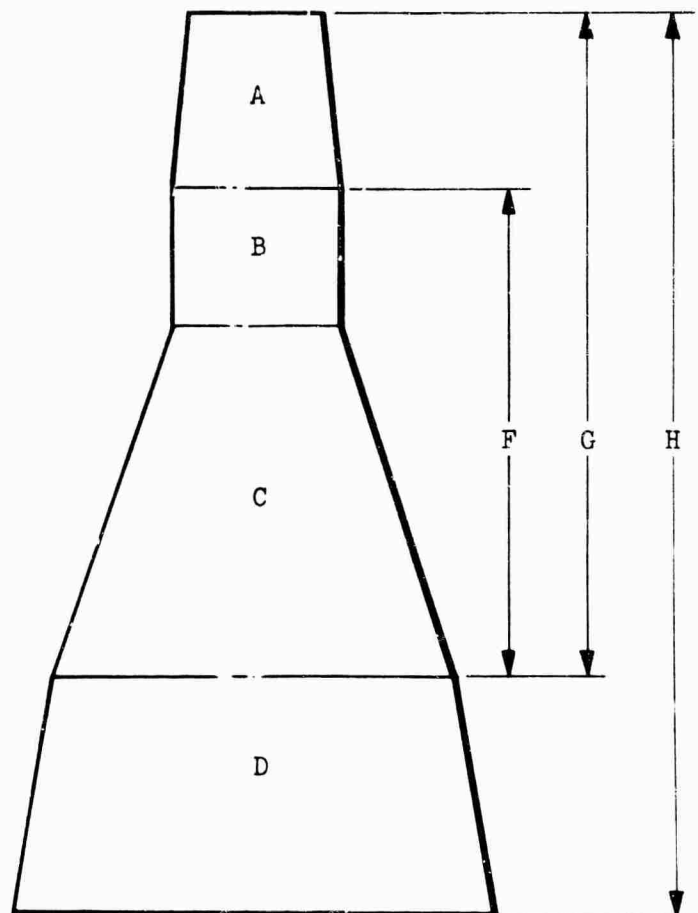
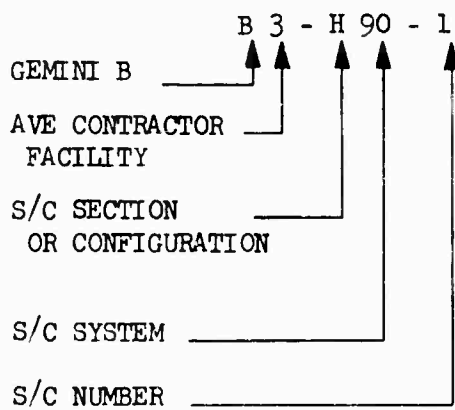
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2.1.1 STDR NUMBERING SYSTEM

THE DIAGRAM SHOWN BELOW IS PROVIDED AS AN AID IN UNDERSTANDING THE STDR NUMBERING SYSTEM.

EXAMPLE:



- A. RECOVERY SECTION
- B. RCS SECTION
- C. CABIN SECTION
- D. ADAPTER SECTION
- E. SPECIAL TEST

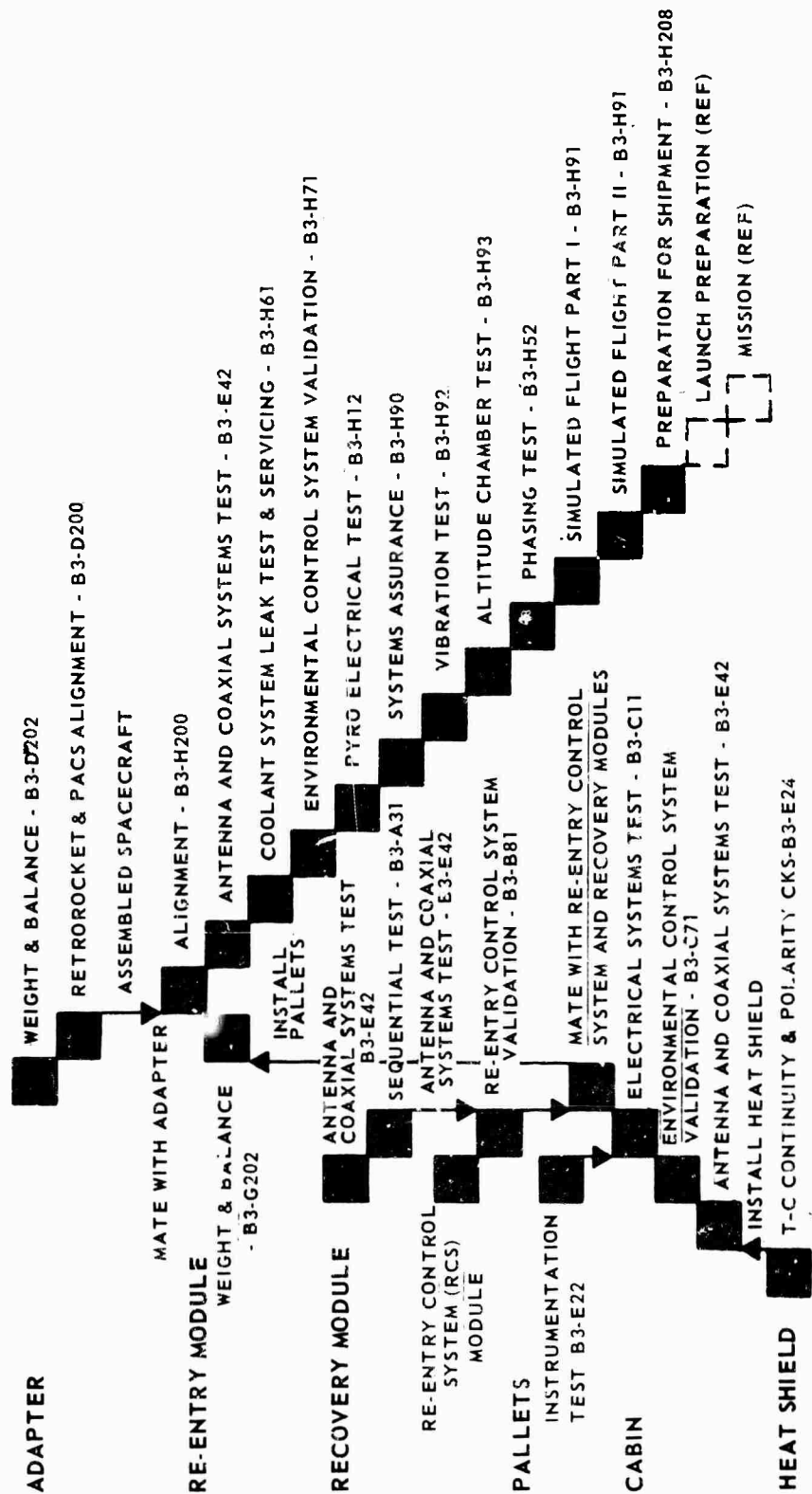
- F. LANDING CONFIGURATION
- G. RE-ENTRY CONFIGURATION
- H. OVERALL SPACECRAFT

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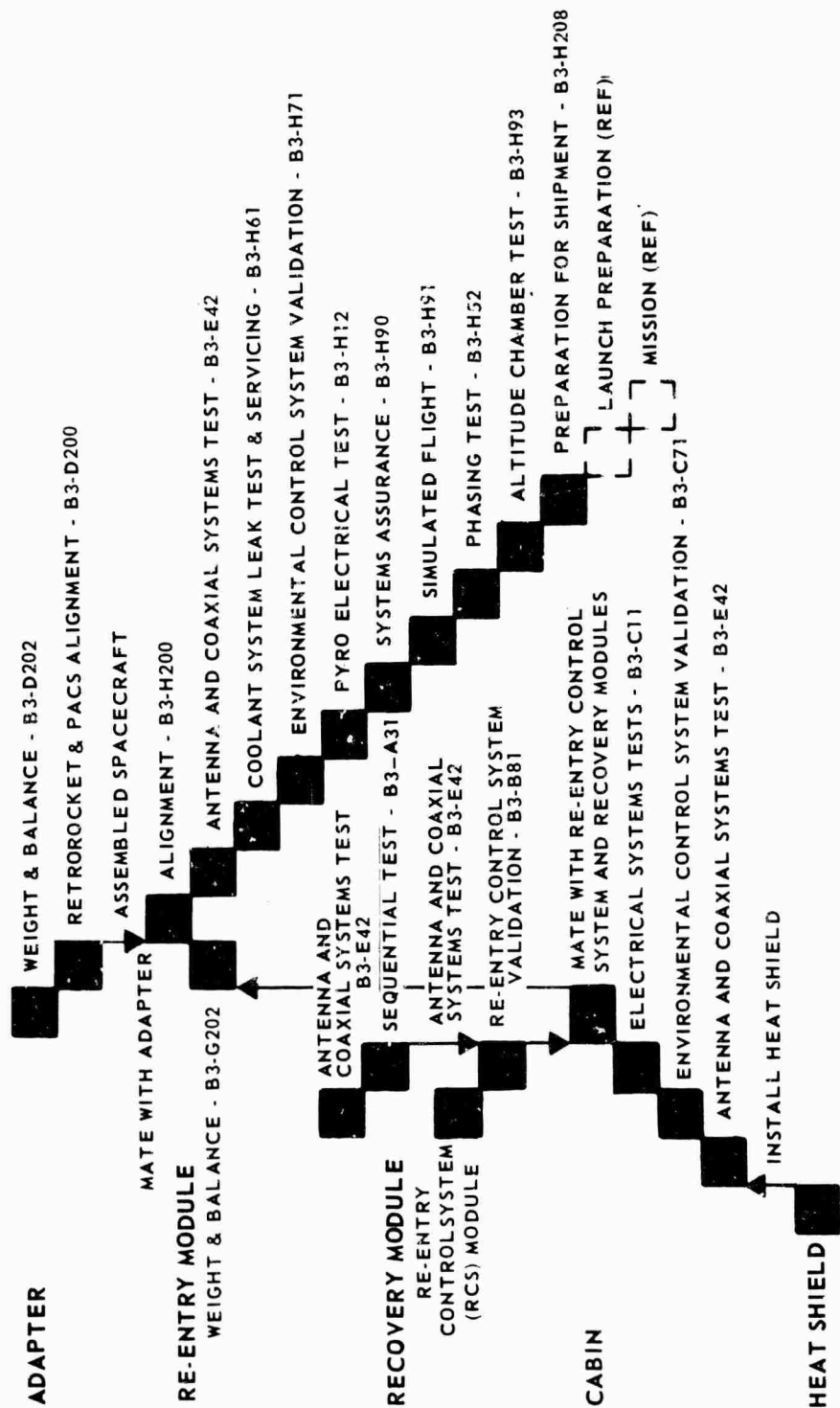
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ANTICIPATED TEST FLOW DIAGRAM (SPACECRAFT SYSTEMS TEST) AEROSPACE VEHICLE EQUIPMENT 1 (GBQ UNMANNED)



2.1.2 FIGURE 2-1 ANTICIPATED TEST FLOW DIAGRAM SST AVE 1 GBQ 1 UNMANNED

ANTICIPATED TEST FLOW DIAGRAM
(SPACECRAFT SYSTEMS TEST)
AEROSPACE VEHICLE EQUIPMENT 2-4 (MANNED)



2.1.2 FIGURE 2-2 ANTICIPATED TEST FLOW DIAGRAM SST AVE 2-4 MANNED

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2.2 PRE-SPACECRAFT SYSTEMS TESTS

2.2.1 TEST PHILOSOPHY

PRE-SPACECRAFT SYSTEMS TEST (PRE-SST) ARE THOSE TESTS WHICH ARE CONDUCTED BY MANUFACTURING DURING THE FINAL MANUFACTURING BUY-OFF TESTS. THESE TESTS ARE CONDUCTED IN ACCORDANCE WITH GROUND SYSTEMS OPERATIONS (GSO) PREPARED PROCEDURES (STDR'S) AND MAY BE MONITORED BY GSO PERSONNEL. THE PRIME PURPOSE OF THESE TESTS IS TO ASSURE STATIC INTEGRITY OF THE FLUID AND GAS SYSTEMS (INCLUDING S/C CABIN LEAKAGE AND PROOF TESTS) PRIOR TO THE S/C ENTERING SST. ALTHOUGH THESE PRE-SST TESTS ARE NOT NORMALLY CONSIDERED A PART OF ACCEPTANCE TESTING, THEY ARE PRESENTED HERE TO PROVIDE A BASIS AND CONTINUITY FOR THE TEST ACTIVITY CARRIED OUT DURING SST.

2.2.2 RE-ENTRY CONTROL SYSTEM TEST (RCS) - STDR B3-B82

(A) TEST OBJECTIVES

THIS TEST WILL CONSIST OF A PROOF AND LEAK TEST OF BRAZED JOINTS IN THE RCS SECTION.

(B) SYSTEMS SERVICED

THE RCS SYSTEM FROM THE PRESSURANT TANK TO REGULATOR INLET SHALL BE PRESSURIZED TO 4500 PSIG FOR HIGH PRESSURE PROOF TEST. THE REGULATOR OUTLET TO THE THRUST CHAMBERS WILL BE PRESSURIZED TO 450 PSIG FOR LOW PRESSURE PROOF TEST. LEAKAGE TESTS UTILIZING HELIUM MASS SPECTROMETER WILL BE PERFORMED AT 3000 PSIG FOR THE HIGH PRESSURE PORTION OF THE SYSTEM AND AT 300 PSIG FOR THE LOW PRESSURE PORTION OF THE SYSTEM.

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2.2.2 RE-ENTRY CONTROL SYSTEM TEST (RCS) - STDR B3-B82 (CONTINUED)

(C) LOCATION AND CONFIGURATION

THE RCS SECTION SHALL BE MOUNTED ON THE RCS SECTION
HANDLING DOLLY IN THE WHITE ROOM (PROOF PRESSURE CAGE).

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
PTF52-00001-595	PRESSURE TEST FIXTURE
PTE52-52000-501-5	RESTRICTOR FITTING (2 REQ'D)
PTE52-52000-501	MANIFOLD
PTE52-52000A-500	DYNATURE ADAPTER (2 REQ'D)
PTE52-52000-503	TEST BOX
ST52-52000-521	SAFETY PROOF PRESSURE CAGE
PTE52E010080-1	TCA DUST COVER (MODIFIED) (8 REQ'D)
CEC24-120A	HELIUM LEAK DETECTOR
N/A	FILTER (10 MICRON ABSOLUTE) (5 REQ'D)
52E440033	TEMP. HARNESS ASSY.
52E440044	TEMP. MONITOR SYSTEM

(E) TEST OUTLINE

- (1) "A" RING PRESSURANT SYSTEM TEST (A, B, C, D, PACKAGE,
REGULATOR AND PROPELLANT TANKS)
- (2) "A" RING PRESSURANT TANK TEST
- (3) "A" RING FUEL MANIFOLD TEST
- (4) "A" RING OXIDIZER MANIFOLD TEST
- (5) PRESSURANT (OXIDIZER) OVERBOARD VENT LINE TEST
- (6) PRESSURANT (FUEL) OVERBOARD VENT LINE TEST
- (7) "B" RING PRESSURANT SYSTEM TEST (A, B, C, D,
PACKAGE, REGULATOR AND PROPELLANT TANKS)

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2.2.2 RE-ENTRY CONTROL SYSTEM TEST (RCS) - STDR B3-B82 (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

- (8) "B" RING PRESSURANT TANK TEST
- (9) "B" RING FUEL MANIFOLD TEST
- (10) "B" RING OXIDIZER MANIFOLD TEST

2.2.3 CABIN - ENVIRONMENTAL CONTROL AND COOLANT SYSTEMS TEST - STDR B3-C72

(A) TEST OBJECTIVES

THIS TEST WILL CONSIST OF CABIN WATER SYSTEM LINES LEAK TEST PRIOR TO INSTALLATION OF ECS SUIT MODULE, CABIN COOLANT SYSTEM LEAK CHECK, STATIC SYSTEM LINES LEAK TEST AND LOW PRESSURE OXYGEN SYSTEM LEAK TEST. THE SYSTEMS WILL BE PRESSURIZED WITH GN₂ AND BUBBLE CHECKED TO LOCATE LEAKS.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE CABIN SECTION WILL BE MOUNTED ON THE RE-ENTRY MODULE HANDLING DOLLY IN THE CLASS 6 WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
PTF52-00001-595	PRESSURE TEST FIXTURE
PTF245-00001-501	PRESSURE TEST FIXTURE
PTE52-52000-501	MANIFOLD
MODEL WA33A-6	GAGE (MARTIN-DECKER, 0.1 INCREMENTS)
52-83708-81	QUICK DISCONNECT (SUIT COMP. PRESSURE)

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MODEL 195B**2.2.3 CABIN - ENVIRONMENTAL CONTROL AND COOLANT SYSTEMS TEST -**
STDR B3-C72 (CONTINUED)**(D) AGE REQUIRED (CONTINUED)**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
N/A	ABSOLUTE FILTER (10 MICRON OR LESS) (2 REQ'D)
R25800CC-4-XXXX	HOSE ASSEMBLIES (3 REQ'D)
N/A	SAFETY SHIELD AND TIEDOWNS
STANDARD "K" SIZE	NITROGEN BOTTLES (GN ₂ PER MIL-P-27401B)
52E360213-45 OR -545	ADAPTER
52E360213-29 OR -529	PLUGS (3 REQ'D)
AN808-4D-505	PLUGS (2 REQ'D)
AN919-5-4D-505	REDUCER
AN919-8-4D-505	REDUCER
AN929-4C-505	CAPS (2 REQ'D)
PTE52-0001-511	WATER MANOMETER
TYPE CG, WINTON	SHERLOCK LEAK DETECTOR SOLUTION

(E) TEST OUTLINE

- (1) CABIN WATER SYSTEM LINES - LEAK TEST
- (2) CABIN PROOF PRESSURE, LEAK AND RELIEF VALVE FUNCTIONAL
- (3) CABIN COOLANT SYSTEM LEAK CHECK
- (4) STATIC SYSTEM LINES LEAK TEST (INSTRUMENTS NOT INSTALLED)
- (5) LOW PRESSURE OXYGEN SYSTEM LEAK TEST

2.2.4 ADAPTER ECS AND COOLANT SYSTEMS TEST - STDR B3-D72**(A) TEST OBJECTIVES**

THIS TEST WILL CONSIST OF ADAPTER ECS GAS, WATER AND COOLANT SYSTEMS LEAK CHECK OF THE LINES LOCATED IN THE

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2.2.4 ADAPTER ECS AND COOLANT SYSTEMS TEST - STDR B3-D72 (CONTINUED)

(A) (CONTINUED)

ADAPTER PRIOR TO INSTALLATION OF THE COOLANT PUMP MODULE.
THE SYSTEMS WILL BE PRESSURIZED WITH GN₂ AND BUBBLE
CHECKED TO LOCATE LEAKS.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE ADAPTER SECTION WILL BE MOUNTED ON THE HANDLING
DOLLY IN THE CLASS 6 WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
PTF52-00001-595	PRESSURE TEST FIXTURE
PTF245-00001-501	PRESSURE TEST FIXTURE
PTE52-52000-501	MANIFOLD
MODEL WA33A-6	GAGE (MARTIN-DECKER, 1.0 INCREMENTS)
N/A	FILTER (10 MICRON ABSOLUTE OR LESS) (2 REQ'D)
R25800CC-4-XXXX	HOSE ASSEMBLIES (3 REQ'D)
N/A	SAFETY SHIELD AND TIEDOWNS
STANDARD "K" SIZE	NITROGEN BOTTLES (GN ₂ PER MIL-P-27401B)
52E360213-45 OR -545	ADAPTER
52E360213-29 OR -529	PLUGS (3 REQ'D)
AN806-4D-505	PLUGS (2 REQ'D)
AN919-5-4D-505	REDUCER
AN919-8-4D-505	REDUCER

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2.2.4 ADAPTER ECS AND COOLANT SYSTEMS TEST - STDR B3-D72 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
AN929-4C-505	CAPS (2 REQ'D)
PTE52-000G1-511	WATER MANOMETER
TYPE CG, WINTON	SHERLOCK LEAK DETECTOR SOLUTION

(E) TEST OUTLINE

- (1) COOLANT SYSTEM LINES - LEAK TEST
- (2) PRIMARY O₂ DISTRIBUTION LINES - LEAK TEST
- (3) WATER SYSTEM LINES - LEAK TEST PRIOR TO ECS SUIT
MODULE INSTALLATION

2.2.5 COOLANT PUMP MODULE TEST - STDR B3-E62

(A) TEST OBJECTIVES

THIS TEST WILL CONSIST OF A PRESSURE DECAY LEAKAGE TEST
OF THE COOLANT PUMP MODULE.

(B) SYSTEM SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE MODULE SHALL BE MOUNTED IN THE HOLDING FIXTURE IN THE
WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
PTF245-00001-501	PRESSURE TEST FIXTURE
649XB-3-6-2	PRESSURE RELIEF VALVE

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MODEL 195B2.2.5 COOLANT PUMP MODULE TEST - STDR B3-E62 (CONTINUED)

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
PTF52-00001-4-509	BACK-TO-BACK ADAPTER (2 REQ'D)
PTF52-00001-6-509	BACK-TO-BACK ADAPTER
AN919D-6-4-505	REDUCER
4423G-2XDM	FILTER (10 MICRON ABSOLUTE)
PTE52-52000-501	MANIFOLD
AN929D-5-505	PRESSURE CAP (4 REQ'D)
R25800CC-4	HOSE ASSEMBLY (7 REQ'D)
STANDARD "K" SIZE	NITROGEN BOTTLE (GN ₂ PER MIL-P-27401B)
TYPE CG, WINTON	SHERLOCK LEAK DETECTOR SOLUTION
ST52-52000-521	SAFETY PROOF PRESSURE CAGE

(E) TEST OUTLINE:

- (1) COOLANT PUMP MODULE - LEAK TEST BY PRESSURE DECAY METHOD.

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2.3 PHASE I TESTING

2.3.1 TEST PHILOSOPHY

(A) PHASE I TESTING ON S/C MODULES AND INDIVIDUAL SYSTEMS IS DESIGNED TO:

- (1) VERIFY THOSE SYSTEM FUNCTIONS AND/OR REDUNDANCIES WHICH CANNOT BE CHECKED IN MATED TESTS.
- (2) VERIFY PRIME POWER DISTRIBUTION AND CONTROL FROM POWER SOURCES TO BUSES AND EQUIPMENT DISCONNECTS.
- (3) ASSESS INTEGRITY OF FLUID AND GAS SYSTEMS.
- (4) VERIFY DETAIL PERFORMANCE OF VARIOUS SUBSYSTEM MODULES PRIOR TO INSTALLATION.
- (5) CONDUCT TESTS ON THOSE SYSTEMS WHEREBY SYSTEM DIFFERENCES ARE MORE EASILY FOUND AND MORE ECONOMICALLY FIXED PRIOR TO COMPLETING SPACECRAFT ASSEMBLY.

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2.3.2 PALLETS TESTS (UNMANNED VEHICLE)

2.3.2.1 PALLET (L/H & R/H) INSTRUMENTATION TESTS - STDR B3-E22

(A) TEST OBJECTIVES

THIS TEST WILL VERIFY OPERATION OF THE INSTRUMENTATION EQUIPMENT LOCATED ON THE INSTRUMENTATION PALLETS.

(B) SYSTEMS SERVICED

(1) CAMERAS (INST. PANEL AND WINDOW)

(2) ANALOG TAPE RECORDER

(C) LOCATION AND CONFIGURATION

TESTS SHALL BE PERFORMED IN THE WHITE ROOM. PALLETS WILL BE MOUNTED PER FLIGHT CONFIGURATION EXCEPT FOR AGE INTERFACE.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E440054-1	DC-DC CONV. LOAD BOX (2 REQ'D)
52T060231	BATTERY CART
52T060441-49	BREAKOUT BOX TAPE RECORDER
58T060001	F/M TELEMETRY GROUND STATION
58T060014	F/M HARDLINE
52E440011	PCM TELEMETRY GROUND STATION
58E040501	LAUNCH VEHICLE/LABORATORY SIMULATOR

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2.3.2.1 PALLET (L/H & R/H) INSTRUMENTATION TESTS - STDR B3-E22
(CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
58TO60044-7	PCM TAPE RECORDER J3 TEST BOX
52-04050	PALLET TEST SET
52-04051	PALLET TEST SET CABLES
803B	FLUKEMETER
555	OSCILLOSCOPE, TEKTRONIX
C12	SCOPE CAMERA AND ADAPTER
5015A	POWER SUPPLY
N/A	FREQUENCY COUNTER

(E) TEST OUTLINE

- (1) PERFORM TM VOLTAGE DISTRIBUTION TEST.
- (2) FUNCTIONALLY TEST VCO ASSEMBLIES AND ADJUST
VCO'S AS REQUIRED.
- (3) FUNCTIONALLY CHECK THE PCM TAPE RECORDER.
- (4) FUNCTIONALLY CHECK ANALOG TAPE RECORDER.
- (5) FUNCTIONALLY CHECK WINDOW CAMERA.
- (6) FUNCTIONALLY CHECK THE SOUND PRESSURE LEVEL
SYSTEM.

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2.3.3 RECOVERY SECTION

2.3.3.1 SEQUENTIAL SYSTEM TEST - STDR B3-A31

(A) TEST OBJECTIVES

THE OBJECTIVES OF THIS TEST ARE TO VERIFY THE INTERNAL WIRING AND OPERATIONS OF RELAY PANEL ASSEMBLIES USING THE UMBILICAL CABLE TESTER.

(B) SYSTEMS SERVICED

NONE

(C) CONFIGURATION AND LOCATION

THE RECOVERY SECTION SHALL BE MOUNTED ON THE MANUFACTURING LINE DOLLY IN THE WHITE ROOM. MAIN CHUTE CANNISTER AND SHINGLES NOT INSTALLED.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E200004	UMBILICAL CABLE TESTER
52T060232	SHORTING PLUGS (6 REQ'D)
52T060441-53	TEST BOX
52T060441-57	TEST BOX
52T060232	CABLE
58T060014	CABLE
5015A	POWER SUPPLY
803B	FLUKEMETER
555	OSCILLOSCOPE, TEKTRONIX
ASTM-15F	THERMOMETER
260	SIMPSON, VOM
52E440047	T/C CHECKOUT BOX

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2.3.3.1 SEQUENTIAL SYSTEM TEST - STDR B3-A31 (CONTINUED)

(E) TEST OUTLINE

- (1) VERIFY INTEGRITY OF RECOVERY SECTION RELAY PANEL FUNCTIONS.
- (2) VERIFY REDUNDANT GROUND WIRES.
- (3) VERIFY OPERATION OF VIBRATION PICKUPS, QD10 AND QD11 (GBQ #1 ONLY).
- (4) INSTRUMENTATION T/C POLARITY CHECK (GBQ ONLY).
- (5) PERFORM OPERATIONAL CHECK OF PILOT CHUTE DEPLOYMENT SWITCH.

2.3.3.2 COMMUNICATION SYSTEM TEST - ANTENNA AND COAXIAL SYSTEMS TEST - STDR B3-E42

(A) TEST OBJECTIVES

THIS TEST SHALL EVALUATE THE OPERATING CHARACTERISTICS OF THE STUB ANTENNA AND ASSOCIATED COAXIAL CABLE WITHIN THE RECOVERY SECTION.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE RECOVERY SECTION SHALL BE MOUNTED ON THE RECOVERY HANDLING DOLLY IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PAR. NUMBER</u>	<u>NOMENCLATURE</u>
N/A (RACKS 327, 328 AND 329)	COMM. VSWR CART
GR-874-F500	LO-PASS FILTER
HP-420A	DETECTOR
HP-415D	SWR METER
PRD 219	SWR DETECTOR

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2.3.3.2 COMMUNICATION SYSTEM TEST - ANTENNA AND COAXIAL SYSTEMS
TEST - STDR B3-E42 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

PART NUMBER

NOMENCLATURE

HP-431B

RF POWER METER

HP-478A

THERMISTOR MOUNT

ASSOCIATED ATTENUATORS, COAX CABLES AND FITTINGS

(E) TEST OUTLINE

PERFORM INSERTION LOSS AND VSWR MEASUREMENT ON STUB
ANTENNA AND CABLE AT VHF VOICE AND RECOVERY FREQUEN-
CIES, (TM AND CMD FREQUENCY GBQ #1 ONLY).

2.3.4 RE-ENTRY CONTROL SECTION

2.3.4.1 COMMUNICATION SYSTEM TEST - ANTENNA AND COAXIAL SYSTEMS
TEST - STDR B3-E42

(A) TEST OBJECTIVES

THIS TEST SHALL EVALUATE THE OPERATING CHARACTERISTICS
OF THE STUB ANTENNA CABLE WITHIN THE RCS SECTION.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE RCS SECTION SHALL BE MOUNTED ON THE RCS HANDLING
DOLLY IN THE WHITE ROOM.

(D) AGE REQUIRED

PART NUMBER

NOMENCLATURE

N/A (RACKS 327, 328
AND 329)

COMM. VSWR CART

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2.3.4.1 COMMUNICATION SYSTEM TEST - ANTENNA AND COAXIAL SYSTEMS
TEST - STD R B3-E42 (CONTINUED)

(C) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
GR-874-F500	LO-PASS FILTER
HP-420A	DETECTOR
HP-415D	SWR METER
PRD 219	SWR DETECTOR
HP-431B	RF POWER METER
HP-478A	THERMISTOR MOUNT
ASSORTED ATTENUATORS, COAX CABLES AND FITTINGS	

(E) TEST OUTLINE

PERFORM INSERTION LOSS/VSWR ON RECOVERY SECTION STUB
ANTENNA CABLE WITHIN RCS SECTION AT VHF VOICE AND
RECOVERY FREQUENCIES, (TM AND CMD FREQUENCY GBQ #1
ONLY).

2.3.4.2 RCS VALIDATION AND FUNCTIONAL TEST - STD R B3-B81

(A) TEST OBJECTIVES

VERIFICATION OF CORRECT INSTALLATION AND INTEGRITY
OF RE-ENTRY CONTROL SYSTEM SHALL BE ESTABLISHED BY
PERFORMING LEAKAGE AND FUNCTIONAL TEST ON THE A AND
B RINGS.

(B) SYSTEMS SERVICED

THE RCS PRESSURANT SYSTEM SHALL BE PRESSURIZED UP TO
3,000 PSIG (USING GH_6 AND GN_2) DURING CONDUCT OF THIS
TEST. REGULATED PRESSURE SYSTEM PRESSURIZED TO 430
PSIG.

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MODEL 195B2.3.4.2 RCS VALIDATION AND FUNCTIONAL TEST - STDR B3-B81 (CONTINUED)

(C) LOCATION AND CONFIGURATION

THE RCS SECTION SHALL BE MOUNTED ON THE RCS SECTION
HANDLING DOLLY IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E420006	PROPULSION SYSTEM CHECKOUT UNIT
52E420007	PROPULSION SYSTEM CONTROL UNIT (RACKS 31/32)
52E420009	PROPULSION SYSTEM ADAPTER KIT
52E420097	CEC HELIUM LEAK DETECTOR
52E420173	CHECK VALVE PRESSURE TEST KIT
52E420144	BOOST PUMP
52E440036	RATIOMETER
N/A	BUBBLER TEST ITEMS
52T060421-3	JUMPER UNIT, "A" PKG.
52T060422-1	CABLE, RCS THRUSTER CNTL
52T060422-5	CABLE, MOTOR VALVES
52T060422-7	CABLE, RCS AGE INTERCONNECT
52T060441-31	TEST BOX
52T060441-41	TEST BOX
52T060442-141	TEST BOX
58T050044-5	TEST BOX
58T060044-3	TEST BOX

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2.3.4.2 RCS VALIDATION AND FUNCTIONAL TEST - STDR B3-B81 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
FA129	ABSOLUTE PRESS GAGE
803B	FLUKEMETER
260	SIMPSON, METER
5015A	POWER SUPPLY
N/A	4K OHM RESISTOR (+ 1%)
ASTM 15F	THERMOMETER (+ 1/2°F.)
N/A	HEAT GUN

(E) TEST OUTLINE

- (1) "B" PACKAGE FUNCTIONAL AND LEAK TEST
- (2) PRESSURE REGULATOR FUNCTIONAL TEST
- (3) PROPELLANT TANK BLADDER LEAK TEST (OXID/FUEL)
- (4) HIGH AND LOW PRESSURE SYSTEM LEAK TESTS
- (5) SOURCE AND REGULATED PRESSURE TRANSDUCER CALIBRATIONS
- (6) MOTOR VALVE FUNCTIONAL AND LEAK TEST
- (7) THRUST CHAMBER ASSEMBLY (TCA) FLOW TEST
- (8) TCA VALVE TIMING AND LEAK TEST
- (9) TEMPERATURE TRANSDUCERS FUNCTIONAL TEST
- (10) HEATER RESISTANCE AND FUNCTIONAL TEST

NOTE

STEPS 1 THROUGH 8 ARE TO BE
PERFORMED SEPARATELY ON THE
A AND B RINGS.

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2.3.5 ADAPTER SECTION

2.3.5.1 COOLANT SYSTEM PUMP MODULE TEST - STDR B3-E61

(A) TEST OBJECTIVES

THIS PROCEDURE FUNCTIONALLY TESTS BOTH PRIMARY AND SECONDARY COOLANT LOOPS OF THE COOLANT PUMP MODULE, PRIOR TO INSTALLATION INTO THE ADAPTER SECTION.

(B) SYSTEMS SERVICED

COOLANT SYSTEM

(C) LOCATION AND CONFIGURATION

THE COOLANT PUMP MODULE SHALL BE FIXTURE MOUNTED (NOT INSTALLED IN THE ADAPTER SECTION) IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180004	COOLANT CART
52E180005	COLD TRAP
52E180022	COOLANT AND SOLVENT CONTAINER
52E180057-3	HOSE ASSEMBLIES
52E180097-3	HOSE ASSEMBLIES
52E180098-1	HOSE ASSEMBLIES
52E180109	ECS ADAPTER CONTROL PANEL
52D180305	CABIN SIMULATOR
52E180145	POWER SUPPLY
52E180150	LEAKAGE TESTER
52E180160	FLUSH AND PURGE UNIT

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2.3.5.1 COOLANT SYSTEM PUMP MODULE TEST - STDR B3-E61 (CONTINUED)

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180167	COOLANT SAMPLING KIT
52E180172	REFRIGERATION UNIT
52T050181-23	TEST BOX
52T060182-29	CABLE
52T060182-37	ADAPTER SIMULATOR CABLE
MDE4583003	LEAKAGE TESTER
52T050183	HOSE ASSEMBLIES
52T060441-51	TEST BOX
58T060044	TEST BOXES
5015A	POWER SUPPLY
ASTM	THERMOMETER
FA 160	PRESSURE GAGE - ABSOLUTE
N/A	PRESSURE GAGE (0-150 PSIG MIN.)
803B	FLUKEMETER
52E440036	RATIOMETER

(E) TEST OUTLINE

NOTE

TEST PROCEDURES APPLY TO BOTH
THE PRIMARY AND SECONDARY COOL-
ANT LOOPS.

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2.3.5.1 COOLANT SYSTEM PUMP MODULE TEST - STDR B3-E61 (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

- (1) SERVICE AND CYCLE PUMPS (VACUUM SERVICE).
- (2) COOL FLUID TO CYCLE THE WATER BOILER AND THERMAL SWITCH.
- (3) PUMP AND POWER SUPPLY OPERATION.
 - (A) CHECK MALFUNCTION LIGHTS BY TURNING PUMPS ON.
 - (B) OBTAIN PUMP INVERTER FREQUENCY, VOLTAGE AND WATTAGE AT VARIOUS INPUT VOLTAGES AND FLOW VS DIFFERENTIAL PRESSURE FOR EACH PUMP.
 - (C) VERIFY RESERVOIR LO-LEVEL LIGHT BY VARYING PRESSURE TO RESERVOIR.
- (4) VERIFY ALL TELEMETRY (TM) TEMPERATURE, PRESSURE AND BI-LEVEL OPERATIONS.
- (5) FLUSH, PURGE AND DRY ENTIRE SYSTEM.
- (6) CONDUCT MODULAR LEAK TEST (100 PSIG WITH GASEOUS NITROGEN).
- (7) CONDUCT CRACK AND RESEAT PRESSURE TEST ON WATER BOILER AND DETERMINE OPERATING LIMITS OF THE PRESSURE SWITCH.
- (8) VERIFY WATER BOILER HEATER OPERATION.
- (9) CHECK GROUND COOLING PRESSURE AND TEMPERATURE INSTRUMENTS.

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2.3.5.2 ECS MODULE TESTS - STTR B3-E72

(A) TEST OBJECTIVES

THIS TEST SHALL INCLUDE A FUNCTIONAL CHECK OF THE CREW TRANSFER UMBILICAL (CTUM) PRIOR TO INTERFACE WITH THE SPACECRAFT AND PRESSURE SUIT ASSEMBLY (PSA).

THE PRIMARY OXYGEN SUBSYSTEM SHALL BE FUNCTIONALLY CHECKED IN TWO MODULES BY THIS PROCEDURE. ONE MODULE WILL CONSIST OF THE BOTTLE, TRANSDUCER, FILL VALVE, REGULATOR AND SHUTOFF VALVE, THE OTHER MODULE CONSISTS OF A BOTTLE AND ADAPTER TO MATE WITH THE FIRST MODULE WHEN INSTALLED IN THE VEHICLE.

THE SECONDARY OXYGEN SUBSYSTEMS (LEFT-HAND AND RIGHT-HAND) SHALL BE FUNCTIONALLY CHECKED AS MODULES BY THIS PROCEDURE.

(B) SYSTEMS SERVICED

INDIVIDUAL OXYGEN MODULES ARE SERVICED TO 5000 PSIG WITH GASEOUS NITROGEN.

(C) LOCATION & CONFIGURATION

THE CTUM AND O₂ MODULES SHALL BE BENCH MOUNTED IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
N/A	BLACK LIGHT
52E180010-1	LOW PRESSURANT BENCH
52E180076	ECS TEST CONSOLE
52T060185	ECS INTEGRATED SYSTEM TESTER
47110	QUICK DISCONNECT NIPPLES (2)

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(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
47115	QUICK DISCONNECT COUPLER (2)
FP 1/2-27-G-10/80	FLOWMETER
1/2 GSVT 45 OR 44	FLOAT ASSEMBLY
N/A	DYNAMOMETER (CAPABLE OF 750 LBS TENSION)
N/A	TURNBUCKLE (CAPABLE OF 750 LBS TENSION)
DDP-50	PUSH SCALE
N/A	WHEATSTONE BRIDGE
N/A	BREAKOUT BOXES (AS REQUIRED)

(E) TEST OUTLINE

(1) CTUM

- (A) PERFORM VISUAL & DIMENSIONAL INSPECTIONS
OF THE UMBILICAL.
- (B) PERFORM LEAKAGE TEST OF OXYGEN HOSE.
- (C) PERFORM OPERATING FORCE CHECKS ON QUICK
DISCONNECTS.
- (D) PERFORM ELECTRICAL CONTINUITY & RESISTANCE
CHECKS OF ELECTRICAL CONNECTORS & WIRING.
- (E) PERFORM DIELECTRIC STRENGTH & INSULATION
RESISTANCE CHECKS OF ELECTRICAL CONNECTORS
& WIRING.
- (F) PERFORM ABOVE TESTS UNDER VARIOUS TETHER
LOAD CONDITIONS.

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MODEL 195B**2.3.5.2 ECS MODULE TESTS - STDR B3-E72 (CONTINUED)****(E) TEST OUTLINE****(2) PRIMARY O₂ SUBSYSTEMS**

- (A) PERFORM TRANSDUCER CALIBRATION.
- (B) PERFORM PRESSURE DECAY LEAKAGE TEST.
- (C) PERFORM SHUTOFF VALVE LEAKAGE TEST.
- (D) PERFORM FILL VALVE PORT LEAKAGE TEST.
- (E) PERFORM PRESSURE REGULATION TEST.
- (F) PERFORM SUBSYSTEM BLOW-DOWN TEST.

NOTE

STEPS (A) THRU (F) ARE PER-
FORMED ON ONE MODULE. THE
OTHER MODULE IS SUBJECTED
TO STEP (B) ONLY.

(3) SECONDARY O₂ SUBSYSTEM

- (A) PERFORM TRANSDUCER CALIBRATION.
- (B) PERFORM PRESSURE DECAY LEAKAGE TEST.
- (C) PERFORM SHUTOFF VALVE LEAKAGE TEST.
- (D) PERFORM FILL VALVE PORT LEAKAGE TEST.
- (E) PERFORM PRESSURE REGULATION TEST.
- (F) PERFORM SUBSYSTEM BLOW-DOWN TEST.

NOTE

STEPS (A) THRU (F) ARE TO BE
PERFORMED ON BOTH MODULES.

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2.3.5.3 ADAPTER SECTION WEIGHT AND BALANCE - STDR B3-D202

(A) TEST OBJECTIVES

THESE PROCEDURES ARE UTILIZED TO OBTAIN THE TOTAL WEIGHT AND LATERAL (X) AND VERTICAL (Y) CENTER OF GRAVITY OF THE ADAPTER SECTION. LONGITUDINAL (Z) CENTER OF GRAVITY WILL BE CALCULATED.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE ADAPTER SECTION SHALL BE IN AS NEAR FLIGHT CONFIGURATION AS POSSIBLE, INVERTED AND MOUNTED ON THE SPACECRAFT ALIGNMENT FIXTURE. DEVIATIONS FROM FLIGHT CONFIGURATION WILL BE CALCULATED.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E010005	SLING ASSEMBLY
52D060001	S/C ALIGNMENT FIXTURE
52E060004	TOOL KIT - OPTICAL ALIGNMENT
52-00001-505	PORTABLE WHITE ROOM
52-00001-541	WORK STAND

(E) TEST OUTLINE

- (1) WEIGH ADAPTER, TO EXHIBIT ACCURACY OF WEIGHING INSTRUMENTS, MOVE LOAD CELLS CLOCKWISE ONE POSITION.
- (2) CALCULATE ORDINATES OF ADAPTER CENTER OF GRAVITY.

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2.3.5.4 RETROROCKET & PACS ALIGNMENT - STDR B3-D200

(A) TEST OBJECTIVES

ALIGNMENT OF THE SIX RETROGRADE ROCKET INTERFACES IN THE ADAPTER SECTION WILL BE ACCOMPLISHED USING A DUMMY ROCKET (LIVE ROCKETS WILL NOT BE USED).

THE DUMMY RETROROCKET TOOL WILL BE UTILIZED TO ALIGN EACH ROCKET INTERFACE TO THE CALCULATED SPACECRAFT CENTER OF GRAVITY LOCATION WHICH EXISTS DURING NORMAL RETROGRADE AT THE MID BURN POINT OF EACH RESPECTIVE ROCKET.

THE PACS THRUSTERS WILL BE ALIGNED WITH RESPECT TO THE GEMINI B c.g. FOR AN ABORT CONDITION.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE ADAPTER SECTION SHALL BE MOUNTED ON THE SPACECRAFT ALIGNMENT FIXTURE.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E010005	SLING ASSEMBLY
52E060001	S/C ALIGNMENT FIXTURE
52E060004	TOOL KIT - OPTICAL ALIGNMENT
52E060024	LENGTH GAGE - RETROROCKET ADJUSTMENT STUD

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2.3.5.4 RETROCKET & PACS ALIGNMENT STDR B3-D200 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
58E060501	RETROCKET LINKAGE GAGE
AFA52-52702-501 TD	DUMMY RETROCKET (MOD.)
52-00001-541	WORK STAND
52-00001-505	PORTABLE WHITE ROOM
T2	THEODOLITE

(E) TEST OUTLINE

- (1) ALIGN ONE RETROCKET INTERFACE (THRUST VECTOR)
WITH RESPECT TO THE c.g. AT TIME OF RETROGRADE
(USING OPTICAL INSTRUMENTS).
- (2) ALIGN REMAINING FIVE ROCKET INTERFACES (ONE AT A
TIME).
- (3) ALIGN PACS THRUSTER WITH RESPECT TO THE GEMINI B
c.g. FOR AN ABORT CONDITION.

2.3.6 CABIN SECTION

2.3.6.1 ENVIRONMENTAL CONTROL SYSTEM (ECS) SUIT MODULE TEST - STDR B3-E71

(A) TEST OBJECTIVES

THIS TEST SHALL FUNCTIONALLY CHECK THE ECS SUIT MODULE
PRIOR TO INSTALLATION IN SPACECRAFT.

(B) SYSTEMS SERVICED

SUIT HEAT EXCHANGER IS SERVICED WITH WATER.

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2.3.6.1 ENVIRONMENTAL CONTROL SYSTEM (ECS) SUIT MODULE TEST -
STDR B3-E71 (CONTINUED)

(C) LOCATION AND CONFIGURATION

THE ECS SUIT MODULE SHALL BE BENCH MOUNTED IN THE
WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180010	LOW PRESSURE BENCH
52E180033	DEMAND REG. TOOL
52E180146	FORCE INDICATOR GAGE KIT
52E180150	COOLANT LEAK RATE TESTER
52T060183	HOSE ASSEMBLIES
52-83708	QUICK DISCONNECTS

(E) TEST OUTLINE

- (1) PERFORM LEAK TEST OF COOLANT SYSTEM USING GASEOUS
NITROGEN.
- (2) DEMAND REGULATORS LEAKAGE AND FUNCTIONAL TEST.
- (3) CABIN PRESSURE REGULATOR LEAKAGE AND FUNCTIONAL
TEST.
- (4) CHECK VALVES LEAK TEST.
- (5) ABSOLUTE PRESSURE SWITCH OPERATION.
- (6) O₂ HI RATE AND SYSTEM SHUTOFF VALVE LEAKAGE,
TORQUE AND FUNCTIONAL TESTS.
- (7) COMPRESSORS AND CHECK VALVES FLOW, POWER OPERA-
TION AND LEAKAGE TESTS.

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2.3.6.1 ENVIRONMENTAL CONTROL SYSTEM (ECS) SUIT MODULE TEST -
STD R B3-E71 (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

- (8) SUIT HEAT EXCHANGER FUNCTIONAL, WATER SEPARATION AND LEAKAGE TESTS.
- (9) SUIT FLOW CONTROL VALVES LEAKAGE AND TORQUE TESTS.
- (10) SOLIDS TRAP LEAKAGE TEST.
- (11) SYSTEM FLOW AND LEAK CHECK.

2.3.6.2 COMMUNICATIONS SYSTEM TEST - ANTENNA AND COAXIAL SYSTEMS
TEST STD R B3-E42

(A) TEST OBJECTIVES

THIS TEST SHALL EVALUATE THE OPERATING CHARACTERISTICS OF THE RF PATHS WITHIN THE CABIN. INSERTION LOSS FOR EACH UNIT ANTENNA CABLING SHALL BE DETERMINED. INSERTION LOSS VSWR AND PHASE ANGLE (WHERE APPLICABLE) MEASUREMENTS WILL BE PERFORMED.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE CABIN SECTION SHALL BE MOUNTED ON THE RE-ENTRY MODULE HANDLING DOLLY IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
N/A (R327, 328, 329)	COMM. VSWR CART
52D190263-1	DESCENT ANTENNA ADAPTER
52D190264	C-BAND ANTENNA PROBE

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MODEL 195B**2.3.6.2 COMMUNICATIONS SYSTEM TEST - ANTENNA AND COAXIAL SYSTEMS
TEST - STDR B3-E42 (CONTINUED)****(D) AGE REQUIRED (CONTINUED)**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E190012	C-BAND PROBE ASS'Y
52E190027-55	COAX RELAY TEST BOX
52E200014-2443-30	CABLE
GR-874-F500	LO-PASS FILTER
HP420A	DETECTOR
HP-415D	SWR METER
PRD-219	SWR DETECTOR
HP-478A	THERMISTOR MOUNT
HP-806B	COAX SLOTTED LINE
HP-431B	POWER METER
GR-1606A	IMPEDANCE BRIDGE
HP-764D	DIRECTIONAL COUPLER
PRD-25CA	DETECTOR PROBE
ASSORTED ATTENUATORS, COAX CABLES AND FITTINGS	

(E) TEST OUTLINE

PERFORM INSERTION LOSS, VSWR AND PHASE ANGLE (WHERE APPLICABLE) MEASUREMENTS ON THE FOLLOWING.

- (1) HF T/R TO WHIP ANTENNA CABLE
- (2) VHF T/R #1 AND #2 TO RCS INTERFACE
- (3) VHF T/R #1 AND #2 TO DESCENT ANTENNA
- (4) RECOVERY BEACON TO RECOVERY ANTENNA AND TO RCS INTERFACE.

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2.3.6.2 COMMUNICATIONS SYSTEM TEST - ANTENNA AND COAXIAL SYSTEMS
TEST - STDR B3-E42 (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

(5) C BEACON ANTENNA SYSTEM AND POWER DIVIDER INPUT
TO C BAND ANTENNA SYSTEM.

(6) TM TO RCS INTERFACE AND TO DESCENT ANTENNA
(GBQ #1 ONLY).

(7) CMD CABLES TO RCS INTERFACE (GBQ #1 ONLY).

2.3.6.3 CABIN SECTION ELECTRICAL SYSTEMS TEST - STDR B3-CL1

(A) TEST OBJECTIVES

THIS TEST SHALL VERIFY PRIME POWER DISTRIBUTION TO
SPACECRAFT SYSTEMS AND PROVIDE INITIAL TESTING OF THE
INSTRUMENTATION AND COMMUNICATION SYSTEMS. PRIME
POWER DISTRIBUTION SHALL BE VERIFIED FOR THE POWER
SYSTEM, GUIDANCE AND CONTROL SYSTEM, COMMUNICATIONS
SYSTEMS AND THE INSTRUMENTATION SYSTEM. BAROSTAT
OPERATIONAL CHECKS WILL BE PERFORMED.

(B) SYSTEMS SERVICED

CAMERAS

TAPE RECORDER

(C) LOCATION AND CONFIGURATION

THE CABIN SECTION SHALL BE MOUNTED ON THE HANDLING
DOLLY IN THE WHITE ROOM. PALLETS ELECTRICALLY CON-
NECTED BUT NOT INSTALLED IN S/C (GBQ #1 ONLY).

(D) AGE REQUIRED

PART NUMBER

52T060191-17

NOMENCLATURE

VOLTAGE BREAKOUT BOX

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2.3.6.3 CABIN SECTION ELECTRICAL SYSTEMS TEST - STD R B3-C11 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52T060191-37	PHASE SHIFTER TEST BOX
52T060192-15	CABLE - VOLTAGE VERIFICATION
52T060192-17	CABLE - VOLTAGE VERIFICATION
52T060192-19	CABLE - VOLTAGE VERIFICATION
52T060192-21	CABLE - VOLTAGE VERIFICATION
52T060231	BATTERY CART
52T060231	EXTERNAL PWR CN'L & MONITOR CONSOLE
52T060232	CABLE
* 52T060441-1	T/M XMTR INPUT TEST BOX
52T060441-3	TEST BOX, INDICATOR
52T060441-17	BREAKOUT BOX AGE 18 AND 19
52T060441-19	AGE 22 BREAKOUT BOX
52T060441-21	AGE 34 BREAKOUT BOX
52T060441-31	TEST BOX INSTRUMENTATION
52T060441-53	BREAKOUT BOX
52T060442-41	TEST SUPPORT CABLE
52T060442-45	TEST SUPPORT CABLE
52T060442-51	TEST SUPPORT CABLE
* 52T060442-77	CABLE FROM COMM. TO T/M J/B
* UNMANNED ONLY	

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(CONTINUED)****(D) AGE REQUIRED (CONTINUED)**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
* 52T060442-79	CABLE FROM COMM. TO T/M J/B
52E180003	(VACUUM PUMP ONLY)
52E190007-1	HEADSET (2 REQ'D)
58E190514-25	AMPLIFIER ASSEMBLY (2 REQ'D)
52E200004	UMBILICAL CABLE TESTER
* 52E230114	PALLET EXTENSION CABLES KIT
52E270423-1	RCS SLVB ASSEMBLY
52E270431-1	ACE J3 T/P BOX
52E270434-1	ACE J4 T/P BOX
52E270438-1	ACE J5 T/P BOX
52E270442-1	ACE J6 T/P BOX
52E270544-1	IMU T/P BOX
52E270545-1	IMU T/P BOX
52E360013	AIR DATA SYSTEMS TESTER
52E440011	PCM GROUND STATION
52E440033	TEMPERATURE REFERENCE HARNESS ASSEMBLY
52E440044-1	TEMPERATURE MONITOR SYSTEM
52E440053	T/M CONTROL CONSOLE ASSEMBLY
52E440064-1	LOAD - DC TO DC CONVERTER (2 REQ'D)

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(CONTINUED)****(D) AGE REQUIRED (CONTINUED)**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E440065	DISTRIBUTION SYSTEM TIMER
* 58T060001	F/M TELEMETRY GROUND STATION
* 58T060014-3	FM HARDLINE
58T060014-4	UMBILICAL ADAPTER FM HARDLINE
58T060023	SHUNT SELECT PANEL
* 58T060044-1	AGE 173 BREAKOUT BOX
58T060044-3	BREAKOUT BOX
58T060044-5	BREAKOUT BOX
* 58T060044-7	PCM TAPE RECORDER J3 TEST BOX
* 58T060044-9	SEP ENABLE AGE BOX
* 58E040501	LV/L SIMULATOR
58D042002-1	SIMULATOR, S/C ADAPTER CABLES
58D042002-3	SIMULATOR, POWER CABLE
* 58D042002-5	SIMULATOR, SPL CABLE
* 58D042004-1	SOUND PRESSURE LEVEL CHAMBER
* 58D042004-3	CABIN MICROPHONE ADAPTER PLATE
58D042012-1	PLATFORM PHASE INDICATOR CHECKOUT
58D42007-5	PRESSURE PORT FITTING
58D442054-1	TELEMETRY JUNCTION BOX

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(CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
* 52-04050	PALLET TEST SET
* 52-04051-11	PALLET TEST SET CABLES
559100	RECOVERY INTERPHONE
25-102B	DECADE RESISTANCE BOX
A7085	HELIPOT, 10K OHM
555	OSCILLOSCOPE, TEKTRONIX
C12	SCOPE CAMERA AND ADAPTER
5015A	POWER SUPPLY
803B	FLUKEMETER
B/B 4904	DOUBLE PULSE GENERATOR
HP 420A	DETECTOR
FA-129	ABSOLUTE PRESSURE GAGE
* MODEL 328	BALLANTINE RMS METER
RACKS 327, 328 & 329	COMMUNICATION VSWR CART
18000-100	POWER SUPPLY - AIR DATA SYSTEM TESTER
N/A	UMBILICAL HARDLINE ADAPTER
N/A	RF HARDLINE
N/A	RF HARDLINE
N/A	RF HARDLINE
N/A	RF HARDLINE
N/A	RF HARDLINE
N/A	RF HARDLINE

* UNMANNED ONLY

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2.3.6.3 CABIN SECTION ELECTRICAL SYSTEM TEST - STDR B3-C11
(CONTINUED)

(D) ACE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
N/A	TEST BOX SUIT DISCONNECT
	VHF TEST ANTENNAS, ASSORTED ATTENUATORS, COAX CABLES AND FITTINGS.
260	SIMPSON, VOM
ASTM15F	THERMOMETER

(E) TEST OUTLINE (POWER SYSTEM AND PRIME POWER DISTRIBUTION)

- (1) PREPOWER CHECK (CHECK FUSES AND ENSURE S/C
BUSES ARE NOT SHORTED TO THE GROUND).
- (2) MAIN, ADAPTER AND SQUIB BATTERY WIRING CHECKS
- (3) LAB INTERFACE DIODE LEAKAGE CHECKS
- (4) EXTERNAL POWER APPLICATION CHECKS
- (5) CABIN AND TRANSFER LTS TEST
- (6) SYSTEMS VOLTAGE DISTRIBUTION CHECKS
INSTRUMENTATION, GUIDANCE AND CONTROL, COMMUNICATION,
ENVIRONMENTAL CONTROL SECTION, RE-ENTRY
CONTROL SECTION AND CABIN/ADAPTER INTERFACE CHECKS.
- (7) SHUNT CALIBRATION
- (8) BUS-TIE SW OPERATION
- (9) MAIN SUB BUS TRANSFER CAPABILITY

(F) TEST OUTLINE (INSTRUMENTATION SYSTEM)

- (1) REGULATED VOLTAGE AND NOISE TEST

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2.3.6.3 CABIN SECTION ELECTRICAL SYSTEMS TEST - STDR B3-C11 (CONTINUED)

(F) TEST OUTLINE (INSTRUMENTATION SYSTEM) (CONTINUED)

- (2) FUNCTIONALLY CHECK THE PRESSURE PARAMETERS
- (3) FUNCTIONALLY CHECK THE TEMPERATURE PARAMETERS
- (4) ACCELEROMETER (SENSITIVITY AXIS) TEST (GBQ #1 ONLY)
- (5) FUNCTIONALLY CHECK CABIN INDICATORS
- (6) FUNCTIONALLY CHECK SOUND PRESSURE LEVEL (SPL)
SYSTEM (GBQ #1 ONLY)
- (7) FUNCTIONALLY CHECK VCO'S (GBQ #1 ONLY)
- (8) FUNCTIONALLY CHECK VIBRATION PICKUPS (GBQ #1
ONLY)
- (9) FUNCTIONALLY CHECK PCM AND ANALOG T/R (GBQ #1 ONLY)
- (10) RE-ENTRY LOCAL STATIC PRESSURE SYSTEM CALIBRATION
(GBQ #1 ONLY)
- (11) FUNCTIONALLY CHECK CAMERAS (GBQ #1 ONLY)
- (12) PERFORM DATA RUN FOR DATA REDUCTION AND EVALUATION

(G) TEST OUTLINE (COMMUNICATIONS)

- (1) PERFORM VOLTAGE DISTRIBUTION TEST
- (2) WITH TEST ANTENNAS ATTACHED TO S/C OR VIA HARD-
LINE, TRANSMIT RF BETWEEN S/C AND VSWR CART TO
CHECK OPERATION OF THE FOLLOWING:
 - (A) VHF VOICE T/R, AND HF VOICE T/R.
 - (B) VOICE COMM CHECKS USING ASTRO 1, MIC 1
AND 2 HEADSET 1 AND 2; ASTRO 2 MIC 1 AND 2,
HEADSET 1 AND 2.

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2.3.6.3 CABIN SECTION ELECTRICAL SYSTEMS TEST - STDR B3-C11 (CONTINUED)

(G) TEST OUTLINE (COMMUNICATIONS) (CONTINUED)

(2) (CONTINUED)

(C) VERIFY VOX KEYING OF THE VHF T/R.

(D) VOICE QUAL. HF T/R AND VHF T/R.

(E) C-BAND BEACON

(F) RECOVERY BEACON

(G) TM (GBQ #1 ONLY)

(H) PHASE SHIFTER POWER SUPPLY

2.3.6.4 ENVIRONMENTAL CONTROL SYSTEM TEST - STDR B3-C71

(A) TEST OBJECTIVES

THIS TEST SHALL FUNCTIONALLY CHECK CABIN AND STATIC
SYSTEM FOR LEAKAGE.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE CABIN SECTION SHALL BE MOUNTED ON THE RE-ENTRY
MODULE HANDLING DOLLY IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52-050855	GAS REG. ASS'Y
52-83708	QUICK DISCONNECTS
52T060044-3	T/M TEST BOX
52T060181-5	L.P. LEAK TESTER
52T060183	HOSE ASSEMBLIES

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2.3.6.4 ENVIRONMENTAL CONTROL SYSTEM TEST - STDR B3-C71 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180027	S/C LEAKAGE TESTER
52E180033	DEMAND REG. TOOL
52E180076	ECS CHECKOUT CONSOLE
52E440036	RATIOMETER
5015A	POWER SUPPLY
803B	FLUKEMETER

(E) TEST OUTLINE

- (1) STATIC SYSTEM LEAK CHECK (NEGATIVE LEAK TEST
AND ALTIMETER FUNCTIONAL CHECK)
- (2) CABIN LEAK CHECK AND RELIEF VALVE FUNCTIONAL
CHECK.

2.3.6.5 (SEATS ASTRONAUTS) WEIGHT AND BALANCE - STDR B3-E202 (AVE 2 ONLY)

(A) TEST OBJECTIVES

THIS STDR OUTLINES THE PROCEDURE FOR INSTALLING
THE EJECTION SEAT ON THE c.g. LOCATING FIXTURE
FOR DETERMINING THE STATIC CENTER OF GRAVITY OF
THE EJECTION SEAT AND ASTRONAUT.

(B) SYSTEMS SERVICED

NONE

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2.3.6.5 (SEATS ASTRONAUTS) WEIGHT AND BALANCE - STDR B3-E202
(AVE 2 ONLY) (CONTINUED)

(C) LOCATION AND CONFIGURATION

THE EJECTION SEAT SHALL BE LOCATED ON THE EJECTION
SEAT DOLLY IN THE WEIGHT AND BALANCE AREA.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E060004	TOOLING KIT-WEIGHING, INDEXING AND OPTICAL EQUIP.
52E060005	EJECTION SEAT c.g. LO- CATING FIXTURE
52E180002	SEAT HOISTING SLING
52E180018	SEAT DOLLY

(E) TEST OUTLINE

- (1) EJECTION SEAT c.g.
- (2) LATERAL c.g. DETERMINATION (VERTICAL ADAPTER)
- (3) ECCENTRIC c.g. DETERMINATION (TILT-BAK ADAPTER)
- (4) LONGITUDINAL c.g. DETERMINATION (VERTICAL
ADAPTER)
- (5) VERTICAL c.g. DETERMINATION (HORIZONTAL ADAPTER)
- (6) REPEAT STEPS 1 THRU 5 WITH ASTRONAUT IN SEAT.

2.3.7 RE-ENTRY MODULE

2.3.7.1 RE-ENTRY MODULE WEIGHT AND BALANCE - STDR B3-G202

(A) TEST OBJECTIVES

PROCEDURES CONTAINED IN THIS DOCUMENT ARE UTILIZED
TO OBTAIN THE WEIGHT AND THREE AXIS CENTER OF GRAVITY
OF THE RE-ENTRY MODULE (MATED CABIN, RCS AND RECOVERY
SECTIONS).

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2.3.7.1 RE-ENTRY MODULE WEIGHT AND BALANCE - STDR B3-G202 (CONTINUED)

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE RE-ENTRY MODULE SHALL BE IN AS NEAR FLIGHT CONFIGURATION AS POSSIBLE AND INSTALLED IN THE ALIGNMENT FIXTURE AND c.g. INDEXING FIXTURE. DEVIATIONS FROM FLIGHT CONFIGURATION SHALL BE CALCULATED.

(D) AGE REQUIRED

PART NUMBER

NOMENCLATURE

52E010038

HOISTING SLING

52E060001

S/C ALIGNMENT FIXTURE

52E060002

WEIGHING & c.g. FIXTURE

52E060004

TOOL KIT - OPTICAL ALIGNMENT

52E00001-505

PORTABLE WHITE ROOM

52-00001-541

WORK STAND

(E) TEST OUTLINE

- (1) PERFORM HORIZONTAL WEIGHING OF RE-ENTRY MODULE.
TO EXHIBIT ACCURACY OF WEIGHING INSTRUMENTS MOVE LOAD CELLS CLOCKWISE ONE POSITION AND REWEIGH.
CALCULATE HORIZONTAL (Z) CENTER OF GRAVITY.
- (2) DETERMINE LOCATION OF FORWARD WEIGHING RING FOR TRUE c.g.

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2.3.7.1 RE-ENTRY MODULE WEIGHT AND BALANCE - STDR B3-G202 (CONTINUED)

(E) (CONTINUED)

- (3) PERFORM VERTICAL WEIGHING OF RE-ENTRY MODULE. TO EXHIBIT ACCURACY OF WEIGHING INSTRUMENTS MOVE LOAD CELLS CLOCKWISE ONE POSITION AND REWEIGH. CALCULATE LATERAL (X) AND VERTICAL (Y) CENTER OF GRAVITY.

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2.4 PHASE II TESTING (ASSEMBLED SPACECRAFT)

2.4.1 TEST PHILOSOPHY

INTEGRATED SPACECRAFT TESTING PROVIDES THE MAXIMUM CONFIDENCE IN THE FLIGHT READINESS OF THE SPACECRAFT BECAUSE:

- (A) SPACECRAFT SYSTEMS SHALL BE IN FLIGHT CONFIGURATION AS NEAR AS POSSIBLE.
- (B) END-TO-END SYSTEM TESTING IS EMPHASIZED BOTH BY SEPARATE SYSTEMS TESTS AND IN A CONCURRENT OPERATION SIMULATING ACTUAL FLIGHTS.

2.4.2 COMMUNICATION SYSTEMS TEST - ANTENNA AND COAXIAL SYSTEMS TEST - STDR B3-E42

(A) TEST OBJECTIVES

OPERATING CHARACTERISTICS OF THE CABIN AND CABIN SECTION TO RECOVERY SECTION RF PATHS SHALL BE VERIFIED BY THIS TEST.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE SPACECRAFT SHALL BE VERTICAL AND MOUNTED ON THE SPACECRAFT HANDLING DOLLY IN THE WHITE ROOM. ALL SPACECRAFT RF TRANSMISSION EQUIPMENT SHALL BE IN FLIGHT CONFIGURATION.

(D) ACE REQUIRED

PART NUMBER

N/A (RACKS 327, 328, 329)

52E130027-55

NOMENCLATURE

COMM. VSWR CART

COAX RELAY TEST BOX

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2.4.2 COMMUNICATION SYSTEMS TEST - ANTENNA AND COAXIAL SYSTEMS TEST - STD R B3-E42 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
L-2443-30	CABLE
GR-1606A	IMPEDANCE BRIDGE
GR-874-F500	LO-PASS FILTER
HP-806B	COAXIAL SLOTTED SECTION
HP-420A	DETECTOR
HP-415D	SWR METER
HP-431B	POWER METER
HP-478A	THERMISTOR MOUNT
PRD-250A	DETECTOR PROBE
PRD-219	SWR DETECTOR
ASSORTED ATTENUATORS, COAXIAL CABLES AND FITTINGS	

(E) TEST OUTLINE

- (1) PERFORM INSERTION LOSS AND/OR VSWR MEASUREMENT ON
THE FOLLOWING:

NOTE

WORK STAND MOVED AWAY FROM S/C

FOR APPLICABLE VSWR MEASUREMENT.

- (A) EXTEND HF WHIP ANTENNA
- (B) HF T/R TO HF WHIP ANTENNA VSWR
- (C) RETRACT HF WHIP ANTENNA
- (D) VHF VOICE T/R AND RECOVERY BEACON TO STUB
ANTENNA, INSERTION LOSS AND VSWR.

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2.4.2 COMMUNICATION SYSTEMS TEST - ANTENNA AND COAXIAL SYSTEMS TEST - STDR B3-E42 (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

(1) (CONTINUED)

(E) TM FREQUENCY TO STUB ANTENNA (GBQ #1 ONLY)

(F) CMD FREQUENCY TO STUB ANTENNA (GBQ #1 ONLY)

(G) C-BAND BEACON TO C-BAND ANTENNAS (VSWR ONLY)

2.4.3 COOLANT SYSTEM LEAK & FUNCTIONAL TEST - STDR B3-H61

(A) TEST OBJECTIVES

VALIDATION OF THE SPACECRAFT COOLANT SYSTEM SHALL BE ACCOMPLISHED BY PERFORMING A LEAK TEST OF THE COOLANT SYSTEM. THE SYSTEM WILL BE PRESSURIZED WITH GN₂ AND THE LEAKAGE WILL BE DETERMINED BY MONITORING SYSTEM PRESSURE DECAY RATES TO VERIFY INTEGRITY OF INSTALLATION. AFTER COMPLETION OF THE TEST, THE SYSTEM SHALL BE SERVICED.

(B) SYSTEMS SERVICED

COOLANT SYSTEM

(C) LOCATION AND CONFIGURATION

THE SPACECRAFT SHALL BE MOUNTED ON THE SPACECRAFT DOLLY IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180150	COOLANT LEAK TESTER
52T060183	HOSE ASSY.
52E180004	COOLANT SERVICING UNIT
52E180150	COOLANT LEAK RATE TESTER
52E180167	COOLANT SAMPLE KIT

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2.4.3 COOLANT SYSTEM LEAK & FUNCTIONAL TEST - STDR B3-H61 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

PART NUMBER

NOMENCLATURE

52E180172

AUXILIARY REFRIGERATION UNIT

52E180183

COOLANT PRESS. KIT

(E) TEST OUTLINE

NOTE

TEST PROCEDURES APPLY TO BOTH

← THE PRIMARY AND SECONDARY SYSTEMS.

- (1) PRESSURIZE SYSTEM WITH GN₂ AND LEAK TEST TOTAL SYSTEM BY MONITORING PRESSURE DECAY.
- (2) CYCLE THE DIVERTER VALVE AND CHECK EQUIPMENT SECTION PRESSURE DROP AT VARIOUS FLOWRATES AND VERIFY OPERATION OF THE DIVERTER AND CHECK VALVES.
- (3) FLOW FLUID AT VARIOUS TEMPERATURES THROUGH THE GEMINI "B"/LAB HEAT EXCHANGER TO VERIFY THE TEMPERATURE CONTROL POINTS.
- (4) CHECK DIVERTER VALVES AND CHECK VALVES FOR INTERNAL LEAKAGE.
- (5) SERVICE SYSTEM PER STDR.
- (6) COOLANT SYSTEM FUNCTIONAL CHECKOUT.

2.4.4 ECS VALIDATION TEST - STDR B3-H71

(A) TEST OBJECTIVES

THIS TEST SHALL VALIDATE THE ECS SYSTEM IN THE FULLY MATED SPACECRAFT.

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PAGE 65REPORT E217MODEL 195B**2.4.4 EGS VALIDATION TEST - STD R B3-H71 (CONTINUED)****(B) SYSTEMS SERVICED**

- (1) PRIMARY O₂ - 5000 PSIG GN₂
- (2) SECONDARY O₂ - 5000 PSIG GN₂
- (3) COOLANT SYSTEM

(C) LOCATION AND CONFIGURATION

THE MATED SPACECRAFT SHALL BE MOUNTED ON THE HANDLING DOLLY IN A VERTICAL POSITION IN THE WHITE ROOM.

(D) AGE REQUIREDPART NUMBERNOMENCLATURE

52-050855

GAS REG. ASS'Y

52-050856

H₂O SYS LEAK TESTER

52-050857

BREAKOUT BOXES

52-050950

HIGH PRESE. COMPRESSOR

MDE4583003

CAPSULE LEAKAGE TESTER

52-83708

QUICK DISCONNECTS

52E180004

COOLANT CART

52E180005

COLD TRAP

52E180022

COOLANT AND SOLVENT CONTAINERS

52E180027

SPACECRAFT LEAK TESTER

52E180033

DEMAND REG. TOOL

52E180052

HOSE ASS'Y PRI O₂

52E180076

EGS TEST CONSOLE

52E180077

HOSE ASS'Y SEC O₂

52E180078

HOSE ASS'Y SEC O₂

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MODEL 195B2.4.4 ECS VALIDATION TEST - STDR B3-H71 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

PART NUMBERNOMENCLATURE

52E180103

HOSE ASS'Y TEST CONSOLE

52E180107

HOSE ASS'Y

52E180108

HOSE ASS'Y

52E180109

CABIN SIMULATOR

52E180120

HOSE ASS'Y TEST CONSOLE

52E180145

POWER SUPPLY

52E180146

FORCE INDICATOR GAGE KIT

52E180150

LEAK TESTER

52E180160

FLUSH AND PURGE KIT

52E180167

COOLANT SAMPLE KIT

52E180172

REFRIGERATION UNIT

52E180194

L.P. LEAK RATE TESTER

52E200014

TEST CABLES

52T060181-7

DEMAND REG. TOOL

52T060181-25

ORIFICE PLATE

52T060181-29

ORIFICE PLATE

52T060183

HOSE ASSEMBLIES

52T060184

HEATER CART

52T060185

INTEGRATED SYSTEMS TESTER

52E230003

SPACECRAFT SEQUENCE RE-
CORDER

52E230005

ANALOG RECORDER

52E230008

BLOCKHOUSE POWER SUPPLY

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MODEL 195B2.4.4 ECS VALIDATION TEST - STDR B3-H71 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E230012	SEQUENTIAL TESTING AND MONITOR CONSOLE
52E230038	SPACECRAFT POWER SUPPLY CONSOLE
52E230068	STE/STC CONSOLE
52E440011	PCM GROUND STATION
52E440036 OR 257-100	RATIOMETER
52E440052	T/M POWER SUPPLY - REMOTE DISPLAY
52E440063	T/M CNTL ASSY
52E440065	DISTR. SYSTEM TIMER
52E040505	SUBSTITUTE - LAB TRANSFER TUNNEL
58E040506	SUB-THERMO MECH LAB

(E) TEST OUTLINE

(1) ECS - SYSTEM

- (A) SUIT CIRCUIT POSITIVE AND NEGATIVE LEAK TESTS
- (B) WATER MANAGEMENT SYSTEM LEAK TEST
- (C) LOW PRESSURE PRIMARY O₂ SYSTEM TEST
- (D) HIGH PRESSURE PRIMARY O₂ SYSTEM TEST
- (E) SECONDARY O₂ SYSTEM TESTS
- (F) ECS HANDLE ACTUATION FORCE TEST
- (G) FAN FLOW AND HI O₂ RATE CHECKS
- (H) PRIM AND SEC O₂ TRANSDUCER AND INDICATOR CALI-
BRATION VERIFICATION
- (I) INTEGRATED CABIN AND TUNNEL LEAK AND FUNCTIONAL
TEST.

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2.4.4 ECS VALIDATION TEST - STDR B3-H71 (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

(1) (CONTINUED)

(J) CHECKOUT EVA HARDWARE INTERFACE WITH SPACECRAFT

(K) PERFORM HELIUM AND OXYGEN ORIFICE FLOW CHECKS

(L) PERFORM HELIUM SHUTOFF AND CHECK VALVES LEAK
CHECK

(M) CREW TRANSFER UMBILICAL (CTUM) LEAKAGE AND
FLOW CHECKS

(N) INTERFACE HEAT EXCHANGER VERIFICATION TEST
USING THERMO MECHANICAL SUBSTITUTE.

2.4.5 PYROTECHNIC ELECTRICAL CHECK - STDR B3-H12

(A) TEST OBJECTIVES

THE PYROTECHNIC ELECTRICAL CHECK SHALL CONSIST OF RESISTANCE AND STRAY VOLTAGE MEASUREMENTS OF SPACECRAFT PYROTECHNIC WIRING. TESTS ARE PERFORMED PRIOR TO AND DURING SYSTEMS ASSURANCE AND SIMULATED FLIGHT TESTS.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE ASSEMBLED SPACECRAFT SHALL BE VERTICAL AND MOUNTED ON THE SPACECRAFT HANDLING DOLLY IN THE WHITE ROOM.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E200014	CABLES
52E400004	PYRO TESTER
52E400017	KIT ASS'Y - PYRO CONTINUITY
52T060232	JUMPER PLUGS

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2.4.5 PYROTECHNIC ELECTRICAL CHECK-STDR B3-H12 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

PART NUMBER

NOMENCLATURE

52T060232

CABLE

58T202037

CABLES

GCE 40-0003

(E) TEST OUTLINE

(1) AGE RESISTANCE CHECK

(2) SHIELD CONTINUITY CHECK

(3) FLIGHT BUNDLES RESISTANCE TESTS

(4) CHECK CLOCKING OF PYRO BUNDLE PLUGS.

(5) PERFORM STRAY VOLTAGE TEST (PERFORMED WITH S/C POWER ON.)

2.4.6 SYSTEMS ASSURANCE TESTS - STDR B3-H90

(A) TEST OBJECTIVES

THE SYSTEMS ASSURANCE TEST SHALL CONSIST OF AN OPERATIONAL TEST OF THE SPACECRAFT SYSTEMS. THIS TEST SHALL VERIFY INTERFACE CONNECTIONS (S/C SECTION INTERFACE NOW MATED) AND PERFORM END TO END FUNCTIONAL TESTING OF SYSTEMS.

(B) SYSTEMS SERVICED

(1) COOLANT SYSTEMS

(2) RCS PRESSURANT (3,000 PSIG GN₂)

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2.4.6 SYSTEMS ASSURANCE TESTS - STDR B3-H90 (CONTINUED)

(B) SYSTEMS SERVICED (CONTINUED)

(3) RCS REGULATED SYSTEM (300 PSIG GN₂)

(4) CAMERAS (GBQ #1 ONLY)

(5) ANALOG TAPE RECORDER (GBQ #1 ONLY)

(C) LOCATION AND CONFIGURATION

THE ASSEMBLED SPACECRAFT SHALL BE VERTICAL AND MOUNTED ON THE SPACECRAFT HANDLING DOLLY IN THE WHITE ROOM. THE SPACECRAFT SYSTEMS SHALL BE IN FLIGHT CONFIGURATION AS NEAR AS POSSIBLE. LAB VEH. ELECT. SUBSTITUTE AND T III M ELECTRICAL SUBSTITUTE CONNECTED.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180004	COOLING & SERVICING UNIT
52E180014	ECS CHECKOUT CONSOLE
52E180033	DEMAND REG. TOOL
52E180057	HOSE ASS'Y
52E180097	HOSE ASS'Y
52E180172-3	REFRIGERATION UNIT
52E180183	PRESSURIZATION KIT
52E190004	S/C COMMUNICATION TEST STATION
52E190007-1	HEADSET (1 REQ'D)
52E190007-9	HEADSET (2 REQ'D)
52E190012	C-BAND PROBE ASS'Y
52D190264	C-BAND ANTENNA PROBE

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MODEL 195B2.4.6 SYSTEMS ASSURANCE TESTS - STDR B3-H90 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
* 52E190513-1	FM CMD C/O STATION
58E190514-25	AMPLIFIER ASSEMBLY (2 REQ'D)
52E200014	CABLES
* 52E230003	MISSION SEQUENCER MONITOR/ CNTL UNIT
52E230003	SPACECRAFT SEQUENCE RECORDER
52E230004	SEQUENTIAL TESTING AND MONITOR CONSOLE
52E230005	ANALOG RECORDER
52E230005	EXTERNAL POWER CONTROL AND MONITOR CONSOLE
52E230008	BLOCKHOUSE POWER SUPPLY
52E230012	SEQUENTIAL CONTROL AND MONITOR CONSOLE
52E230038	SPACECRAFT POWER SUPPLY CONSOLE
52E230068	STE/STC CONSOLE
52E230133	RECORDER - SEQUENCE EVENTS
* 52E230114	CABLES
52E270003	TEST CONSOLE, COMPUTER SYSTEMS
52E270008	IMU BREAKOUT BOX
52E270009	BOXES - TEST POINTS. ACSE
52E270037	TEST CONSOLE, ATTITUDE CONTROL SYSTEM ELECTRONICS
52E270042	TEST CONSOLE, INERTIAL MEASURING UNIT

* UNMANNED ONLY

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MODEL 195B**2.4.6 SYSTEMS ASSURANCE TESTS - STDR B3-H90 (CONTINUED)****(D) AGE REQUIRED (CONTINUED)**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E270062	RECORDER ASS'Y GUIDANCE AND CONTROL SYSTEM TEST
52E270063	CABINET ASS'Y - GUIDANCE AND CONTROL MONITORS
52E270083	ANCILLARY RACKS - ACSE
52E270423	RCS, SVLB
58E270803	COMPUTER DATA DISPLAY SYSTEM
52E360013	AIR DATA SYSTEMS TESTER
52E400004	PYRO TESTER
52E400005	SQUIB SIMULATOR CONSOLE
52E420006	PROPULSION SYSTEM C/O UNIT
52E420007	PROPULSION SYSTEM CONTROL UNIT (R3/132)
52E420007	PROPULSION SYSTEM MONITOR CONSOLE (R23/24)
52E420009	PROPULSION SYSTEM ADAPTER KIT
52E420144	BOOST PUMP
52E440011	PCM GROUND STATION
52E440033	TEMPERATURE REF. HARNESS ASS'Y
52E440044	TEMPERATURE MONITOR SYSTEM
52E440052	POWER SUPPLY T/M - REMOTE DISPLAY
52E440063	T/M CONTROL CONSOLE

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<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E440064	LOAD, DC TO DC CONVERTER (2 REQ'D)
52E440065	DISTRIBUTION SYSTEM TIMER
58D442054	TELEMETRY JUNCTION BOX
52T060191-1	VOICE CHECK UNIT
52T060231	BATTERY CART
52T060232	CABLES
52T060271-49	RATE GYRO PWR MONITOR BOX
52T060422-1	CABLE, RCS THRUSTER CNL.
52T060422-7	CABLE, RCS AGE INTERCONNECT
* 52T060441-1	T/M TRANSMITTER INPUT TEST BOX
52T060441-11	TEST BOX, DC/DC CONVERTER OUTPUT POWER (2 REQ'D)
52T060441-13	TEST BOX
52T060441-15	TEST BOX
52T060441-17	AGE 18 & 19 BREAKOUT BOX
52T060441-19	AGE 22 BREAKOUT BOX
52T060441-21	AGE 34, BREAKOUT BOX
52T060441-23	TEST BOX
52T060441-25	AGE 147, BREAKOUT BOX
52T060441-41	TEST BOX
* 52T060442-77	CABLE FROM COMM. TO T/M J/B

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MODEL 195B2.4.6 SYSTEMS ASSURANCE TESTS - STDR B3-H90 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
* 52T060442-79	CABLE FROM COMM. TO T/M J/B
52T060442-149	TEST BOX
52T060442-151	TEST BOX
* 58T060001	F/M TELEMETRY GROUND STATION
* 58T060014	CABLES
* 58T060014-3	F/M HARDLINE
58T060023	CABLES
* 58T060023	.05G/BARO SIM & PALLET LOAD SIM.
* 58T06044-1	AGE 173, BREAKOUT BOX
* 58T06044-7	PCM TAPE RECORDER J3 TEST BOX
* 58T06044-9	SEP. ENABLE AGE BOX
58D202037	CABLES
58D202043	CABLES
* 58D042004-1	SOUND PRESSURE LEVEL CHAMBER
* 58D042004-3	CABIN MICROPHONE ADAPTER PLATE
559100	RECOVERY INTERPHONE
GFE	HELMET ASSEMBLY (2 REQ'D)
102779	CABLE, RCS AGE PWR
N/A	LAB SIMULATOR
N/A	TITAN III M SIMULATOR
* 58E040501	LV/L SIMULATOR
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MODEL 195B2.4.6 SYSTEMS ASSURANCE TESTS - STD R B3-H90 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
N/A	ATTENUATORS, COAX CABLES & FITTINGS
N/A	THERMOSTAT COOLING PROBE
FA129	ABSOLUTE PRESSURE GAGE (2 REQ'D)
HP 428	CURRENT PROBE (DC)
MODEL 803B	FLUKEMETER
MODEL 555	OSCILLOSCOPE, TEKTRONIX (2 REQ'D)
C12	SCOPE CAMERA AND ADAPTER (2 REQ'D)
18000-100	POWER SUPPLY - AIR DATA SYSTEM TESTER
* MODEL 328	BALLANTINE RMS METER

2.4.6.1 TEST OUTLINE

(A) ELECTRICAL TEST OUTLINE

- (1) VERIFY S/C CONFORMS TO SINGLE POINT GND DESIGN.
- (2) S/C POWER UP AND VOLTAGE DISTRIBUTION VERIFICATION.
- (3) T-III M AND LABORATORY VEHICLE INTERFACE CHECKS
USING BOOSTER SIMULATOR AND LABORATORY SIMULATOR.
- (4) COOLANT ELECTRICAL TEST (VERIFY COOLANT PUMPS IN
OPERATION).
- (5) LIGHTING CHECKS
- (6) FEEDER LINE RESISTANCE MEASUREMENTS

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2.4.6.1 TEST OUTLINE (CONTINUED)

(A) ELECTRICAL TEST OUTLINE (CONTINUED)

(6) (CONTINUED)

(A) IGS

(B) ADAPTER BATTERY CHECKS

(C) MAIN BATTERY CHECKS

(7) BAROSTAT OPERATIONAL CHECKS

(A) AVE 1-4

(B) AVE 1 PALLET

(B) INSTRUMENTATION

(1) TEST POINT VOLTAGE CHECK

(2) INSTRUMENTATION SYSTEM CHECK, CHECK REGULATED VOLTAGE, INTERFACE, STATIC PARAMETERS AND ALL PARAMETERS EXCITED BY THE INSTRUMENTATION SYSTEM.

(3) CHECKOUT GB/LAB VEHICLE INTERFACE USING LAB SIMULATOR (ON ORBIT MONITOR SYSTEM OF GEMINI B CRITICAL PARAMETERS, VERIFY RECEPTION OF 5.12 KBPS WAVETRAIN TO LAB VEHICLE SGLS BASE BAND AND INSTRUMENTATION CONTROLS FROM LAB VEHICLE ON AVE #2 - 4).

(4) ADAPTER STRUCTURAL TEMPERATURE AND VIBRATION SURVEY (GBQ #1 ONLY).

(5) LOCAL STATIC PRESSURE SYSTEM CALIBRATION (GBQ #1 ONLY).

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2.4.6.1 TEST OUTLINE (CONTINUED)

(B) INSTRUMENTATION (CONTINUED)

(6) OPERATIONAL CHECK OF THE FM INSTRUMENTATION
SYSTEM (GBQ #1 ONLY).

(7) DATA EVALUATION OF ANALOG TAPE RECORDER AND
CAMERAS (GBQ #1 ONLY).

(C) COMMUNICATIONS TEST

(1) HF XMTR - RCVR

(A) TEST POINT VOLTAGE CHECK

(B) RECEIVER SENSITIVITY TEST

(C) RECEIVER FREQUENCY AT MAXIMUM RESPONSE
TEST

(D) XMTR POWER AND FREQUENCY TEST

(E) VERIFY VOICE QUALITY

(F) HF/DF TEST

(2) VHF XMTR - RCVR (2)

(A) TEST POINT VOLTAGE CHECK

(B) RECEIVER SENSITIVITY TEST

(C) RECEIVER FREQUENCY AT MAXIMUM RESPONSE TEST

(D) XMTR POWER AND FREQUENCY TEST

(E) VERIFY VOICE QUALITY

(3) VHF RECOVERY BEACON

(A) TEST POINT VOLTAGE CHECK

(B) MEASURE FREQUENCY AND PWR

(C) MODULATION CHARACTERISTICS

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2.4.6.1 TEST OUTLINE (CONTINUED)

(C) COMMUNICATIONS TEST (CONTINUED)

(4) C-BAND BEACON

- (A) TEST POINT VOLTAGE CHECK
- (B) RECEIVER SENSITIVITY TEST
- (C) BAND WIDTH
- (D) CENTER FREQUENCY
- (E) SLOT TOLERANCE
- (F) MEASURE XMTR PWR AND FREQUENCY
- (G) PULSE WIDTH AND PRF
- (H) PHASE SHIFTER OPERATION

(5) TM XMTR (GBQ #1 ONLY)

- (A) TEST POINT VOLTAGE TEST
- (B) PWR, FREQUENCY AND MODULATION

(6) CMD RECEIVER (GBQ #1 ONLY)

- (A) CENTER FREQUENCY CHECK
- (B) RECEIVER SENSITIVITY AND BANDWIDTH
- (C) RELAY RESPONSE

(7) LAB INTERFACE USING LAB SIMULATOR

- (A) VERIFY SIGNAL QUALITY
- (B) VERIFY VHF SWITCHING

(8) TRANSFER UMBILICAL

- (A) VERIFY VOICE QUALITY

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2.4.6.1 TEST OUTLINE (CONTINUED)

(C) COMMUNICATIONS TEST (CONTINUED)

(9) PERSONNEL SURVIVAL VHF TRANSCEIVER INTERFACE
VERIFICATION

(10) VOICE CONTROL CENTER

(11) VCC INTERFACE WITH PSA

(12) PSA INTERFACE

(A) VERIFY VOICE QUALITY

(D) RCS RING A & B - HIGH AND LOW PRESSURE TRANSDUCERS
TESTS, PROPELLANT MOTOR VALVE FUNCTIONAL TEST, TCA
FLOW AND VALVE TIMING TEST. IN ADDITION, RCS HEATER
TEST, SOURCE AND REGULATED PRESSURE SYSTEMS WILL BE
PRESSURIZED TO SYSTEM OPERATING PRESSURE, AND WILL
REMAIN SO PRESSURIZED THROUGHOUT THE REMAINING PHASE
II TESTS.

(E) INERTIAL MEASUREMENT UNIT (IMU) TEST

(1) IMU - POWER UP AND VOLTAGE TESTS

(A) IMU TURN-ON SEQUENCE

(B) FAST HEAT

(C) SPIN MOTOR EXCITATION

(D) STAB LOOP CLOSURE

(E) CHECK AC AND DC VOLTAGES AND FREQUENCY

(F) PLUS AND MINUS X, Y AND Z DELTA V

(2) IGS PLATFORM MALFUNCTION DETECTOR TEST

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2.4.6.1 TEST OUTLINE (CONTINUED)

(E) INERTIAL MEASUREMENT UNIT (IMU) TEST (CONTINUED)

- (3) SLIP RING WIPE TEST
- (4) CAGE MODE TEST (SEF AND BEF)
- (5) ORBIT RATE MODE TEST
- (6) GIMBAL FLIP TEST
- (7) MANUAL TORQUING OF IMU GIMBALS
- (8) GYRO COMPASSING (SEF AND BEF) USING ORBIT ALIGN
TECHNIQUES

(F) IMU INTERFACE TEST

- (1) IMU-ATTITUDE DISPLAY GROUP INTERFACE
- (2) INTERFACE CHECK BETWEEN LAB AND G & C USING LAB
SIMULATOR

(G) ATTITUDE CONTROL ELECTRONICS GROUP (ACEG) TESTS

- (1) ACEG INVERTER OPERATION
- (2) PULSE MODE TEST
VERIFY: ATT H/CNTL - ACE PULSE GENERATOR
- (3) RE-ENTRY (RATE COMMAND) MODE TEST
VERIFY: RATE AND H/CNTL SWITCHING THRESHOLDS
(RCS) H/CNTL DIODE W/B CHECK
- (4) RATE COMMAND MODE TEST
VERIFY: H/CNTL TELEMETRY CAL CHECK

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2.4.6.1 TEST OUTLINE (CONTINUED)

(G) ATTITUDE CONTROL ELECTRONICS GROUP (ACEG) TESTS
(CONTINUED)

(4) (CONTINUED)

VERIFY: PRI AND SEC RATE GYRO OPERATION, RATE
GYRO/ACE ADG/TM INTERFACE, ACE PRI AND
SEC POWER AND LOGIC, ACE SWITCHING LEVELS
AND DEADBAND (RCS), ARC SUPPRESSION FOR
RCS JETS (RING A & B), DIODE PACKAGE
SUPPRESSOR CHECK, RATE GYRO RUN UP/RUN
DOWN TIME. (PRI & SEC)

(5) DIRECT MODE TEST

VERIFY: ATT. H/CNTL - ACE - RCS INTERFACE
RCS/TM INTERFACE

(6) PACS FUNCTIONAL VALIDATION TEST

- (A) ACE - PATE INTERFACE
- (B) PATE - THRUSTERS INTERFACE
- (C) PACS - POWER AND LOGIC CONTROL CIRCUITS
- (D) ABORT HANDLE CONTROL ON PACS OPERATION

(7) ACEG PLATFORM MODE TEST

- (A) ACE - IMU INTERFACE
- (B) ACE SWITCHING LEVEL WITH IMU AND RATE GYRO
INPUTS.

(8) ACEG COMPUTER VALIDATION TEST

- (A) ACE - COMPUTER INTERFACE TEST
- (B) ACE - SWITCHING LEVEL WITH COMPUTER AND
R/G INPUTS

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2.4.6.1 TEST OUTLINE (CONTINUED)

(G) ATTITUDE CONTROL ELECTRONICS GROUP (ACEG) TESTS
(CONTINUED)

(9) ACTS FUNCTIONAL VALIDATION TEST

(A) ATT. H/CNTRL - LAB INTERFACE CHECK

(B) ACTS MODE SELECT/LAB INTERFACE CHECK

(H) COMPUTER TESTS (DIAGNOSTIC TEST SOFTWARE)

(1) POWER APPLICATION AND VOLTAGE CHECKS

(2) MALFUNCTION DETECTOR CHECK

(3) DISCRETE TEST

(A) CHECK MODE SWITCH SOFTWARE CONTROL DISCRETES

(4) COMPUTER INTERFACE CHECK

(A) DAS TEST

(1) VERIFY PROPER TRANSFER OF COMPUTER DATA
TO TELEMETRY SYSTEM

(B) LAUNCH DISCRETE TEST

(C) ATM TEST

(1) VERIFY POWER ATM OPERATION AND TRANSFER
OF DATA.

(D) MDIU TEST

(1) VERIFY MDIU OPERATION AND CORRECT
INSERTION OF DATA

(E) IVI TEST

(1) VERIFY COMPUTER DRIVE AND MANUAL OPERA-
TION OF IVI'S.

(F) TRS TEST

(1) CHECK PROPER READING AND UPDATING OF
TRS BY COMPUTER.

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2.4.6.1 TEST OUTLINE (CONTINUED)

(H) (4) (CONTINUED)

(G) FDI TEST

- (1) CHECK POLARITY AND MAGNITUDE OF COMPUTER OUTPUTS AND RESULTING FDI READINGS.

(H) GIA TEST

- (1) VERIFY TRANSFER OF DIGITAL DATA AND STEERING SIGNALS TO T-III M VIA THE GIA AND INTERFACE CABLING TO BIFS.

- (2) VERIFY GIA TO FDI INTERFACE.

(I) AUXILIARY COMPUTER POWER UNIT (A.C.P.U.) FUNCTION TEST

- (1) VERIFY COMPUTER SELF CHECK OPERATION.
- (2) VERIFY PROPER COMPUTER SHUTDOWN UPON COMMAND OR WHEN LOSS OF POWER OCCURS.

(I) IGS TEST

(1) IMU GIMBAL ANGLE TEST

- (A) PERFORM GIMBAL ANGLE BIAS AND ACCURACY TEST.

(2) IMU ACCELEROMETER TEST

- (A) VERIFY IMU ACCELEROMETER DATA TO COMPUTER AND ACCELEROMETER MATRIX.

(3) INERTIAL MODE TEST

- (A) OPEN LOOP NORTH REFERENCE ALIGNMENT

- (1) GYRO DRIFT PARAMETERS
- (2) ACCEL BIAS
- (3) ACCEL SCALE FACTOR
- (4) ACCEL MISALIGNMENT (ORTHOGONALITY)

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2.4.6.1 TEST OUTLINE (CONTINUED)

- (J) LAUNCH THRU IMPACT - SEQUENTIAL SYSTEM CHECKOUT USING
SQUIB BUS NO. 1:
 - *(1) L/H PALLET
 - *(2) L/H AND R/H PALLET
- (K) ABORT SYSTEM CHECKS - SEQUENTIAL SYSTEM CHECKOUT USING
SQUIB BUS NO. 1:
 - *(1) L/H PALLET
 - *(2) L/H AND R/H PALLET
- (L) LAUNCH THRU IMPACT - SEQUENTIAL SYSTEM CHECKOUT USING
SQUIB BUS NO. 2:
 - *(1) R/H PALLET
 - *(2) L/H AND R/H PALLET
- (M) ABORT SYSTEM CHECKS - SEQUENTIAL SYSTEM CHECKOUT USING
SQUIB BUS NO. 2:
 - *(1) R/H PALLET
 - *(2) L/H AND R/H PALLET
- (N) VERIFY THE TIME REFERENCE SYSTEM AND PERFORM ACCURACY
TESTS.
 - (1) EVENT TIMER START, RESET AND RUNDOWN.
 - (2) ELECTRONIC TIMER RESTART AND OPERATION.

2.4.7 SIMULATED FLIGHT TEST STDR B3-H91

(A) TEST OBJECTIVES

SIMULATED FLIGHT WILL DEMONSTRATE THE OPERATIONAL
MISSION READINESS OF SYSTEMS. SEQUENTIAL SYSTEM

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2.4.7 SIMULATED FLIGHT TEST STDR B3-H91 (CONTINUED)

(A) TEST OBJECTIVES (CONTINUED)

REDUNDANCIES SHALL HAVE BEEN VERIFIED PRIOR TO EXERCISING SYSTEMS IN RELATED FLIGHT SEQUENCES. THE TEST WILL CONSIST OF TWO PARTS. PART I IS FOR GBQ #1 ONLY, PART II IS FOR GBQ 1 AND AVE 2 THRU AVE 4. PARAGRAPH 2.4.7 WILL BE UTILIZED FOR BOTH PARTS (I AND II).

(B) SYSTEMS SERVICED

- (1) COOLANT SYSTEMS
- (2) RCS PRESSURANT (3000 PSIG GN₂)
- (3) ANALOG TAPE RECORDER (GBQ #1 ONLY)
- (4) CAMERAS (GBQ #1 ONLY)

(C) LOCATION AND CONFIGURATION

THE ASSEMBLED SPACECRAFT SHALL BE MOUNTED ON THE SPACECRAFT HANDLING DOLLY IN THE WHITE ROOM AND VERTICALLY LEVELED.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180004	COOLING AND SERVICING UNIT
52E180014	ECS CHECKOUT UNIT
52E180033	TOOL DEMAND REGULATOR
52E180057	HOSE ASSY
52E180076	ECS CHECKOUT CONSOLE
52E180097	HOSE ASSY
52E180172-3	REFRIGERATION UNIT
52E180183	PRESSURIZATION KIT
52E190004	S/C COMMUNICATIONS TEST STATION

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(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E190007-1	HEADSET (1 REQ'D)
52E190007-9	HEADSET (2 REQ'D)
52E190012	C-BAND PROBE ASSY
* 58E190513-1	FM CMD C/O STATION
58E190514-25	AMPLIFIER ASSEMBLY (2 REQ'D)
52E200014	CABLES
52E230003	SEQUENCE RECORDER
* 52E230003	MISSION SEQUENCER MONITOR/ CNTRL UNIT
52E230004	CONSOLE, SEQUENTIAL TEST AND MONITOR
52E230005	EXTERNAL POWER CONTROL AND MONITOR
52E230005	ANALOG RECORDER
52E230008	BLOCKHOUSE POWER SUPPLY
52E230012	CONSOLE, SEQUENTIAL CONTROL AND MONITOR
52E230038	SPACECRAFT POWER SUPPLY
52E230068	STE/STC CONSOLE
52E230133	RECORDER - SEQUENCE EVENTS
* 52E230114	CABLES
52E270003	TEST CONSOLE - COMPUTER, SYSTEMS
52E270023	MEMORY LOADER
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(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E270037	TEST CONSOLE, ATTITUDE CONTROL SYSTEM ELECTRONICS
52E270039	SIMULATOR S/C GUIDANCE AND CONTROL SYSTEMS
52E270042	TEST CONSOLE - INERTIAL MEASURING UNIT
52E270062	RECORDER ASSY - GUIDANCE AND CONTROL SYSTEM TEST
52E270063	CABINET ASSY - GUIDANCE AND CONTROL MONITORS
52E270094	LOADER VERIFIER UNIT TESTER (FOR ATM)
52E270423	RCS, SVIB
52E270803	CDDS
52E360013	AIR DATA SYSTEM TESTER
52E400004	PYRO TESTER
52E400005	SQUIB SIMULATOR
52E420007	PROPULSION SYSTEM MONITOR CONSOLE (R23/24)
52E420013-3	N ₂ PRESSURIZATION UNIT
52E420182-1	TCA FIRING VERIFICATION KIT
52E440011	PCM GROUND STATION
52E440033	TEMPERATURE REF. HARNESS ASSY
52E440044	TEMPERATURE MONITOR SYSTEM
52E440052	POWER SUPPLY T/M - REMOTE DISPLAY

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(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E440063	T/M CONTROL CONSOLE
52E440064	LOAD - DC TO DC CONVERTER (2 REQ'D)
52E440065	DISTRIBUTION SYSTEM TIMER
52T060181-5	LEAK TESTER
52T060181-7	DEMAND REG. TOOL
52T060185	INTEGRATED SYSTEM TESTER
52T060191-1	VOICE CHECK UNIT
52T060231	POWER CONTROL RELAY PANEL
52T060231	BATTERY CART
52T060232	CABLES
* 52T060441-1	T/M TRANSMITTER INPUT TEST BOX
52T060441-11	TEST BOX, DC/DC CONVERTER OUTPUT POWER (2 REQ'D)
52T060441-17	AGE 18 & 19 BREAKOUT BOX
52T060441-19	AGE 22, BREAKOUT BOX
52T060441-21	AGE 34, BREAKOUT BOX
52T060441-23	TEST BOX
52T060441-25	AGE 147, BREAKOUT BOX
52T060442-41	TEST BOX
* 52T060442-77	CABLE FROM COMM. TO T/M J/B
* 52T060442-79	CABLE FROM COMM. TO T/M J/B
* UNMANNED ONLY	

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MODEL 195B**2.4.7 SIMULATED FLIGHT TEST-STD B3-H91 (CONTINUED)****(D) AGE REQUIRED (CONTINUED)**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52T060442-149	TEST BOX
52T060442-151	TEST BOX
* 58T060001	F/M TELEMETRY GROUND STATION
* 58T06014-3	F/M HARDLINE
* 58T060023	.05 G/BARO SIMULATOR
* 58T060044-1	AGE 173, BREAKOUT BOX
* 58T060044-7	PCM TAPE RECORDER J3 TEST BOX
58T060044-9	SEP ENABLE AGE BOX
58T060097	TRANSIENT DETECTOR (6)
52-050484	CABLES
52-050857	BREAKOUT BOXES
* 58D042004-1	SOUND PRESSURE LEVEL CHAMBER
* 58D042004-3	CABIN MICROPHONE ADAPTER PLATE
58D042012-1	PLATFORM PHASE INDICATOR CHECKOUT
58D202037	CABLES
58D202043	CABLES
58D442054	TELEMETRY JUNCTION BOX
N/A	LAB SIMULATOR
N/A	TITAN III M SIMULATOR
FA129	ABSOLUTE PRESSURE GAGE (2 REQ'D)
* 58E040501	LV/L SIMULATOR
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2.4.7 SIMULATED FLIGHT TEST - STDR B3-H91 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
MODEL 803B	FLUKEMETER
MODEL 555	OSCILLOSCOPE, TEKTRONIX (2 REQ'D)
18000-100	POWER SUPPLY - AIR DATA SYSTEM TESTER
C12	SCOPE CAMERA AND ADAPTER (2 REQ'D)
GFE	HELMET ASSEMBLY (2 REQ'D)
N/A	HEAT GUN
* MODEL 328	BALLANTINE RMS METER

VHF TEST ANTENNAS, ATTENUATORS, COAX CABLES AND FITTINGS.

2.4.7.1 SIMULATED FLIGHT TEST - PART I - STDR B3-H91 (GBQ #1 ONLY)

(A) TEST OBJECTIVES

THIS TEST SHALL VALIDATE SPACECRAFT SYSTEMS BEFORE PERFORMING PART II. A BRIEF OPERATIONAL TEST SHALL BE PERFORMED ON THE SYSTEMS.

(B) TEST OUTLINE

(1) LAUNCH THRU IMPACT - SEQUENTIAL SYSTEM CHECKOUT

USING SQUIB BUS NO. 1:

(A) L/H PALLET

(B) L/H AND R/H PALLET

(2) ABORT SYSTEM CHECKS - SEQUENTIAL SYSTEM CHECKOUT

USING SQUIB BUS NO. 1:

(A) L/H PALLET

(B) L/H AND R/H PALLET

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2.4.7.1 SIMULATED FLIGHT TEST - PART I - STDR B3-H91 (GBQ #1 ONLY)
(CONTINUED)

(P) TEST OUTLINE (CONTINUED)

(3) LAUNCH THRU IMPACT - SEQUENTIAL SYSTEM CHECKOUT
USING SQUIB BUS NO. 2:

(A) R/H PALLET

(B) L/H AND R/H PALLET

(4) ABORT SYSTEM CHECKS - SEQUENTIAL SYSTEM CHECKOUT
USING SQUIB BUS NO. 2:

(A) R/H PALLET

(B) L/H AND R/H PALLET

(5) COMMUNICATION

(A) HF XMTR - RCVR - DETERMINE XMTR POWER AND
FREQUENCY, DETERMINE RCVR SENSITIVITY AND
FREQUENCY.

(B) VHF XMTR - RCVR - DETERMINE XMTR POWER AND
FREQUENCY, DETERMINE RCVR SENSITIVITY AND
FREQUENCY.

(C) UHF - RECOVERY BEACON - DETERMINE POWER AND
FREQUENCY.

(D) C-BAND BCN - DETERMINE XMTR POWER AND FRE-
QUENCY. DETERMINE RECEIVER SENSITIVITY AND
FREQUENCY.

(E) TELEMETRY - DETERMINE POWER AND FREQUENCY.

(F) CMD - DETERMINE FREQUENCY AND SENSITIVITY.

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2.4.7.1 SIMULATED FLIGHT TEST - PART I - STDR B3-H91 (GBQ #1 ONLY) (CONTINUED)

(B) TEST OUTLINE (CONTINUED)

(6) INSTRUMENTATION

- (A) DETERMINE TEST AREA AMBIENT PRESSURE AND TEMPERATURE.
- (B) PERFORM AN OPERATIONAL CHECK OF THE PCM, FM/FM AND CAMERA INSTRUMENTATION SYSTEMS.
- (C) RUN A PARAMETER SURVEY.
- (D) PERFORM A DATA RUN, PLAYBACK ON BOARD TAPES AND EVALUATE THE DATA; PROCESS AND EVALUATE FILM.

(7) G & C

- (A) PERFORM OPERATIONAL AND INTERFACE TESTS ON THE FOLLOWING SYSTEMS: IMU, COMPUTER, ACEG SYSTEM, AND THEIR PERIPHERAL EQUIPMENT.

2.4.7.2 SIMULATED FLIGHT TEST - PART II - STDR B3-H91

(A) TEST OUTLINE

- (1) RUN #1 - NORMAL SIMULATED FLIGHT (LAUNCH THRU IMPACT) INCLUDES COMPUTER TEST PROGRAMS FOR THE FOLLOWING MODES, (ASCENT, ORBIT, RE-ENTRY), SQUIB SIMULATORS INSTALLED FOR THE RUN (HESS'S).
- (2) RUN #2 - ABORT SIMULATED FLIGHT INCLUDES MODE A ABORT INITIATED PRIOR TO LIFT-OFF TO SIMULTANEOUSLY SIMULATE CONDITIONS FOR THE SEQUENTIAL AND PACS SYSTEM. HESS'S SHALL BE USED AS SQUIB SIMULATORS AND INSTALLED IN THE SQUIB SIMULATOR RACK WITH UMBILICAL EJECTED.

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2.4.7.2 SIMULATED FLIGHT TEST - PART II - STD R B3-H91 (CONTINUED)

(A) TEST OUTLINE (CONTINUED)

- (3) RUN #3 - ABORT SIMULATED FLIGHT (ABORT INITIATED AT TIME DURING FLIGHT TO SIMULTANEOUSLY SIMULATE MODE B ABORT CONDITIONS FOR THE SEQUENTIAL SYSTEM). HESS'S SHALL BE USED AS SQUIB SIMULATORS AND INSTALLED IN SQUIB SIMULATOR RACK. EMERGENCY DROGUE CHUTE DEPLOY INITIATED DURING LANDING PHASE (SIMULATES EMERGENCY LANDING CONDITIONS), UMBILICALS AND MOL & LV SIMULATORS CONNECTED. SIMULATORS SHALL BE DISCONNECTED AT APPROPRIATE TIMES.
- (4) RUN #4 - NORMAL SIMULATED FLIGHT (LAUNCH THRU IMPACT). MINIMUM AGE CONNECTED, UMBILICAL DROP AS PART OF COUNTDOWN, LAUNCH VEHICLE ELECTRICAL INTERFACE SUBSTITUTE DISCONNECTED AT ORBITING VEHICLE SEP. COMPUTER IN STANDBY MODE, IMU IN INERTIAL MODE. HESS'S SHALL BE USED AS SQUIB SIMULATORS AND INSTALLED IN RACK. MOL/LV SIMULATOR CONNECTED AND DISCONNECTED PER MISSION PROFILE.
- (5) RUN #5 - EMI - NORMAL SIMULATED FLIGHT (LAUNCH THRU IMPACT). MINIMUM SYSTEMS AGE, ADDITIONAL EMI AGE. DEMONSTRATE SAFETY MARGINS OF CRITICAL CIRCUITS (AVE #1 AND AVE #2 ONLY).
- (6) TCA INTERNAL LEAKAGE CHECK (AVE #1 ONLY).
- (7) VERIFY INTEGRITY OF RCS TCA ELECTRICAL WIRING AFTER LOADBANKS ARE REMOVED AND S/C W/B'S ARE CONNECTED. (AVE #1 ONLY)

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2.4.8 GUIDANCE AND CONTROL (G & C) PHASING TEST - STDR B3-H52

(A) TEST OBJECTIVES

THIS TEST WILL VERIFY THAT THE IGS AND FLIGHT CONTROL SYSTEM PROVIDES PROPER OUTPUT SIGNAL PHASING FOR ACTUAL SPACECRAFT MOVEMENT AND ATTITUDE ERRORS. END-TO-END PHASING VERIFICATION SHALL BE ACCOMPLISHED BY PHYSICALLY MOVING THE SPACECRAFT (PHYSICAL RATES AND ATTITUDE ERRORS) WHILE THE SPACECRAFT IS MOUNTED IN THE HORIZONTAL HANDLING TRAILER. COLD GAS FIRING OF RCS THRUSTERS WILL INDICATE CORRECT PHASING.

(B) SYSTEMS SERVICED

NONE

(C) LOCATION AND CONFIGURATION

THE ASSEMBLED SPACECRAFT SHALL BE HORIZONTAL AND MOUNTED ON THE HORIZONTAL TRANSPORTATION TRAILER.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E190004	COMM. GROUND STATION
52E200014	CABLES
52E230003	S/C SEQUENCE RECORDER
52E230005	EXT. PWR. CNTL & MON. SYS.
52E230008	BLOCKHOUSE PWR SUPPLY
52E230012	SEQ CONTROL & MON. CONSOLE
52E230038	S/C PWR SUPPLY CONSOLE

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(CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E230068	STE/STC CONSOLE
52E270062	RECORDER ASS'Y G & C SYS TEST
52E270063	CABINET ASS'Y G & C MONITOR
58E270803	CDDS
52E420013-3	N ₂ PRESSURIZATION UNIT
52E420182-1	TCA FIRING VERIFICATION KIT
52E440011	PCM TM GROUND STATION
52E440052	POWER SUPPLY - TM REMOTE
52E440063	CONSOLE - TM CONTROL
52E440065	DISTRIBUTION SYSTEM TIMER
52T060231	BATTERY CARTS
52T060232	CABLES
52T060441-7	AGE 18 & 19, BREAKOUT BOX
52T060441-17	TEST CABLES
* 52T060442-77	COAX FROM COMM TO T/M J/B
* 52T060442-79	COAX FROM COMM. TO T/M J/B
52T060442-149	TEST CABLES
58D202037	CABLES
58D442054	COAX JUNCTION BCX
803B	FLUKEMETER
555	OSCILLOSCOPE, TEKTRONIX

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2.4.8 GUIDANCE AND CONTROL (G & C) PHASING TEST - STDR B3-H52
(CONTINUED)

(E) TEST OUTLINE

- (1) PHYSICALLY MOVE THE SPACECRAFT IN THE PITCH, ROLL AND YAW AXES (ONE AT A TIME) AND VERIFY THE RATE OF MOVEMENT CAUSES CORRECT THRUSTER FIRE FOR EACH AXIS. VERIFY BY FEELING COLD GAS EXITING FROM THE THRUSTERS.
- (2) TCA INTERNAL LEAKAGE CHECK (AVE 2-4)
- (3) VERIFY INSTRUMENTATION ACCELEROMETER POLARITY CHECK (GBQ ONLY)
- (4) INDUCE PHYSICAL SPACECRAFT ATTITUDE ERRORS (POSITIVE AND NEGATIVE) IN THE PITCH, ROLL AND YAW AXES (ONE AT A TIME). VERIFY SPACECRAFT LADDER OUTPUTS TO LAUNCH VEHICLE AND ATTITUDE DISPLAY INDICATIONS FOR EACH ATTITUDE ERROR (COMPUTER IN ASCENT MODE). CHECK FOR CHANNEL CROSSTALK.

2.4.9 ALTITUDE CHAMBER TEST - STDR B3-H93

(A) TEST OBJECTIVES

ALTITUDE CHAMBER TESTS WILL VALIDATE PERSONNEL SENSITIVE ELEMENTS OF THE ECS SYSTEM DURING A SIMULATED ALTITUDE ENVIRONMENT AND INTERPOSE MAN IN THE LOOP TO PROVIDE A LOAD ON THE ECS AND TO MAKE A QUALITATIVE EVALUATION OF THE ECS OPERATION. ONE UNMANNED ALTITUDE RUN AND ONE MANNED ALTITUDE RUN TO 150K FEET SHALL BE PERFORMED. ONLY THOSE SYSTEMS REQUIRED FOR ECS SUPPORT OR SAFETY WILL BE POWERED UP.

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2.4.9 ALTITUDE CHAMBER TEST - STDR B3-H93 (CONTINUED)

(B) SYSTEMS SERVICED

- (1) COOLANT SYSTEMS
- (2) ECS PRIMARY O₂ - (2000 PSIG GOX)
- (3) ECS SECONDARY O₂ - (2000 PSIG GOX)
- (4) RCS PRESSURANT (3000 PSIG GN₂)
- (5) RCS REGULATED PRESSURE (3000 PSIG GN₂)
- (6) WATER SYSTEM
- (7) ANALOG TAPE RECORDER (GBQ #1 ONLY)
- (8) CAMERAS (GBQ #1 ONLY)

(C) LOCATION AND CONFIGURATION

THE ASSEMBLED SPACECRAFT SHALL BE HORIZONTALLY MOUNTED ON THE SPACECRAFT HORIZONTAL TRANSPORT TRAILER LOCATED IN THE ALTITUDE CHAMBER. ALL SPACECRAFT SYSTEMS SHALL BE IN AS NEAR FLIGHT CONFIGURATION AS POSSIBLE. HATCHES, EJECTION SEATS, AND THE AGE ECS ACCESS DOOR SHALL BE INSTALLED. POWER SHALL BE SUPPLIED VIA THE UMBILICAL.

(D) AGE REQUIRED

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180004	COOLING & SERVICING UNIT
52E180007	ECS DOOR
52E180014	ECS CHECKOUT UNIT
52E180027	S/C LEAK TESTER
52E180030	GOX HIGH PRESSURE REGULATOR PANEL
52E180033	DEMAND REG. TOOL
52E180047	LIOH CANNISTER INSTALLATION KIT

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2.4.9 ALTITUDE CHAMBER TEST - STDR B3-M93 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E180048	GOX CART - HOSE ASS'Y
52E180076	ECS TEST CONSOLE
52E180077	HOSE ASS'Y (HI PRESSURE)
52E180078	HOSE ASS'Y (HI PRESSURE)
52E180103	LEAKAGE TESTER HOSE ASS'Y
52E180106	TEST CONSOLE HOSE ASS'Y
52E180107	LEAKAGE TESTER HOSE ASS'Y
52E180108	LEAKAGE TESTER HOSE ASS'Y
52E180113	OXYGEN ANALYZER
52E180120	TEST CONSOLE HOSE ASS'Y
52E180126	LIOH SHIPPING CONTAINER
52E180168	HOSE ASS'Y (COOLANT)
52E180169	LEAKAGE TESTER HOSE ASS'Y
52E180170	TEST CONSOLE HOSE ASS'Y
52E180172	REFRIG. UNIT
52E180183	COOLANT PRESS. KIT
58E181226	HOSE ASSY'S - UMB HE/O ₂
58E181228	CNTL PANEL - DUAL GAS
58E181229	CALIBRATION UNIT PO ₂ SENSOR
52E190004	COMMUNICATION TEST STATION
52E190007-1	HEADSET (1 REQ'D)
52E190007-9	HEADSET (2 REQ'D)

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(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52E190012	C-BAND PROBE ASS'Y
* 58E190513-1	FM CMD C/O STATION
58E190514-25	AMPLIFIER ASSEMBLY (2 REQ'D)
52E200014	CABLES
52E230003	RECORDER - S/C SEQ.
52E230004	CONSOLES SEQ TESTING & MONITOR
52E230005	EXTERNAL POWER SYSTEM CONTROL & MONITOR
52E230008	BLOCKHOUSE POWER SUPPLY
52E230012	SEQUENTIAL CONTROL AND MONITOR CONSOLE
52E230038 (BLDG. 103)	SPACECRAFT POWER SUPPLY
52E230068	S/C TEST CONDUCTOR CONSOLE
58E270803	CDDS
52E420007	PROPULSION SYSTEM MONITOR CONSOLE (R23/24)
52E440011	PCM GROUND STATION (2 REQ'D)
52E440052	POWER SUPPLY FOR T/M REMOTE DISPLAYS
52E440063	T/M CONTROL CONSOLE
52E440065	DISTRIBUTION SYSTEM TIMER
52T060181-7	DEMAND REG. TOOL
52T060181-9	O ₂ SAMPLING ADAPTER
52T060181-13	S/C EXT. HATCH KEY

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2.4.9 ALTITUDE CHAMBER TEST - STD R B3-B93 (CONTINUED)

(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
52TO60181-15	EMERGENCY BATT. CART
52TO60181-17	TEST CONTROL CONSOLE
52TO60181-25	ORIFICE PLATE
52TO60181-29	ORIFICE PLATE
52TO60183	HOSE ASSEMBLIES
52TO60185	INTEGRATED SYSTEM TESTER
52TO60191-1	VOICE CHECK UNIT
52TO60231	EMER. PWR OFF CONTROL BOX
52TO60231	POWER CONTROL RELAY PANEL
52TO60231	BATTERY CART
52TO60232	CABLES
52TO60192-65	CABLE
52TO60192-67	CABLE
52TO60192-69	CABLE
52TO60441-119	TEST CABLES
* 52TO60442-77	COAX CABLE
* 52TO60442-79	COAX CABLE
52TO60442-149	TEST CABLES
52TO60442-151	TEST CABLES
* 58TO60001	F/M TELEMETRY GROUND STATION
* 58TO60014-3	F/M HARDLINE
58D202037	CABLES
58D442054	TELEMETRY JUNCTION BOX

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(D) AGE REQUIRED (CONTINUED)

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
MDE4583003	CAPSULE LEAKAGE TESTER
52-050484	CABLES
52-050850	EMERGENCY EGRESS STAND
52-050851	EMERGENCY EGRESS HOIST
52-050852	TEST COND. CONSOLE ELECT. CABLING
52-050854	TEST COND. CONSOLE ELECT. CABLING
52-050855	GAS REG. ASS'Y
52-050857	BREAKOUT BOXES
52-050858	T.V. CAMERA BOOM
52-050859	SUIT HX SERVICE UNIT
5283708	QUICK DISCONNECTS
MODEL 260	SIMPSON, VOM
MODEL 555	TEKTRONIX SCOPE
MODEL 803B	FLUKEMETER
REMOTE C-BAND BEACON INTERROGATION RACK (R326)	
ASSORTED ATTENUATORS, COAX CABLES AND FITTINGS	
N/A	TB2 PWR CONSOLE (TQT)
N/A	TQT BACK UP BATT RACK
N/A	BIO MED SUIT HARNESS
GFE	(2) PRESSURE SUIT ASSEMBLY
GFE	HELMET ASSEMBLY (2)
GFE	DRC CHECK GAUGES

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2.4.9 ALTITUDE CHAMBER TEST - STDR B3-H93 (CONTINUED)

(E) TEST OUTLINE

(1) UNMANNED ALTITUDE RUN

(A) PERFORM A POWER-UP VERIFICATION OF SYSTEMS

REQUIRED TO SUPPORT THE ECS PRIOR TO SECURING ALTITUDE CHAMBER (GO-NO-GO CHECK OF PWR, SEQ. COMM AND TM).

(B) SECURE CHAMBER, PUMP DOWN TO 150K FEET ALTITUDE AND RETURN TO AMBIENT. DURING THE RUN, SPACE CRAFT POWER SHALL BE SUPPLIED EXTERNALLY THRU THE UMBILICALS. WATER TRANSFER TIMES AND EVAPORATIVE HEAT EXCHANGER OPERATING WILL BE VERIFIED. ALTITUDE SENSITIVE ECS FUNCTIONS WILL BE VALIDATED AT THIS TIME BY OPERATING WHILE AT ALTITUDE. THE CABIN PRESSURE RELIEF VALVE, SUIT DEMAND REGULATORS, CABIN PRESSURE REGULATOR, AND SUIT FANS WILL BE FUNCTIONALLY TESTED DURING THE ALTITUDE RUN. CALIBRATION VERIFICATION OF PARAMETERS REQUIRING ALTITUDE SHALL BE PERFORMED THROUGHOUT THE RUN. SAFETY ANEROID CHECK WILL THEN BE CONDUCTED BY PUMPING DOWN CHAMBER TO 61K FEET.

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2.4.9 ALTITUDE CHAMBER TEST - STD R B3-H93 (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

(2) MANNED ALTITUDE RUN

NOTE

DURING MANNED CHAMBER TESTS, SAFETY
PRECAUTIONS SUCH AS USE OF CABIN
PRESSURE RELIEF VALVES, EMERGENCY
COMMUNICATIONS SYSTEM AND STANDBY
RESCUE TEAM WILL BE TAKEN.

- (A) POWER-UP, PERFORM A VERIFICATION OF SYSTEMS
REQUIRED TO SUPPORT THE ECS.
- (B) INSERT SUITED CREWMEN AND SECURE CHAMBER FOR
RUN.
- (C) VERIFY BIO MED AGE INSTR.
- (D) VERIFY DRC CHECK GAUGE INSTALLATION AT AMBIENT
AND AT ALTITUDE.
- (E) PERFORM ALTITUDE RUN TO 15000 FEET AND RETURN
TO AMBIENT.
- (F) PERFORM ECS/PSA INTERFACE TEST DURING BOTH
PRESSURIZED AND DECOMPRESSED CABIN TESTS.
- (G) PERFORM CHECK ON OPTICAL SIGHT.

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2.4.10 VIBRATION TEST (UNMANNED VEHICLE GBQ #1 ONLY) - STDR B3-H92

(A) TEST OBJECTIVES

THE TEST SHALL DEMONSTRATE THE FUNCTIONAL INTEGRITY OF THE OPERATIONAL SPACECRAFT EQUIPMENT. A LOW-LEVEL SINUSIODAL SWEEP AND RANDOM VIBRATION TEST WILL BE CONDUCTED ON THE SPACECRAFT IN EACH MAJOR AXIS (X, Y AND Z).

SINUSIODAL VIBRATION FREQUENCIES AND LEVELS ARE THE SAME AS THOSE USED ON THE NASA GEMINI PROGRAM. THE FREQUENCIES ARE DIVIDED INTO THE DIFFERENT RANGES TO FACILITATE READOUT OF SPECIAL INSTRUMENTATION INSTALLED TO MONITOR VIBRATION LEVELS. RANDOM VIBRATION TIME SPANS ARE THE SAME AS THOSE USED ON THE NASA GEMINI PROGRAM. THE TIME SPAN IS APPROXIMATELY THE LENGTH OF TIME THE VEHICLE WILL SEE THIS VIBRATION LEVEL.

(B) SYSTEMS SERVICED

- (1) COOLANT SYSTEM
- (2) ECS PRIMARY O₂ (5,000 PSIG GN₂)
- (3) ECS SECONDARY O₂ (5,000 PSIG N₂)
- (4) RCS PRESSURANT (3,000 PSIG GN₂)
- (5) RCS PROPELLANT TANKS (125 PSIG N₂)
- (6) WATER SYSTEM (EXCEPT SUIT HX)
- (7) RCS REGULATED PRESSURE (125 PSIG GN₂)
- (8) ANALOG TAPE RECORDERS (GBQ #1 ONLY)
- (9) CAMERAS (GBQ #1 ONLY)

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2.4.10 VIBRATION TEST (UNMANNED VEHICLE GBQ #1 ONLY) - STDR B3-H92
(CONTINUED)

(C) LOCATION AND CONFIGURATION

THE ASSEMBLED SPACECRAFT SHALL BE MOUNTED ON THE VIBRATION FIXTURE IN A VERTICAL POSITION. CONFIGURATION WILL BE AS FOLLOWS:

- (1) THE INSTRUMENTATION PALLETS WILL BE INSTALLED
(INCLUDING FLIGHT BATTERIES).
- (2) ALL ACCESS DOORS INSTALLED.
- (3) C-BAND ANTENNA SYSTEM COVERS REMOVED.
- (4) STUB ANTENNA COVER REMOVED.
- (5) BATTERIES (S/C POWER INSTALLED AND SERVICED).
- (6) LESS INSTALLED IN ASCENT AND ABORT SQUIB CKTS.
- (7) THE FOLLOWING SYSTEMS SHALL BE PRESSURIZED TO
OPERATING PRESSURE AND MONITORED DURING AND AFTER
VIBRATION FOR LEAKAGE.
 - (A) RCS PRESSURANT TANKS, FUEL AND OXIDIZER PRO-
PELLANT TANKS.
 - (B) PRIMARY O₂ AND SECONDARY O₂ - (5,000 PSIG GN₂)
 - (C) COOLANT - COOLANCL 15
 - (D) WATER TANKS
- (8) THE COOLANT SYSTEM AND SUIT FANS SHALL BE OPERATING.

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(CONTINUED)****(D) AGE REQUIRED**PART NUMBERNOMENCLATURE

52E180014

ECS C/O UNIT

52E180183

PRESSURIZATION KIT

52E190004

COMMUNICATION TEST STATION

52E200004

TESTER UMBILICAL CABLE

52E270062

RECORDER ASS'Y - GUIDANCE
AND CONTROL SYSTEM TEST

52E400004

TESTER PORTABLE PYROTECHNIC

52E420007

PROPULSION SYSTEM MONITOR
CONSOLE (R23/24)

52E440011

PCM GROUND STATION

52E440052

T/M POWER SUPPLY - REMOTE
DISPLAY

52E440063

T/M CONTROL ASSEMBLY

52E440065

DISTRIBUTION SYSTEM TIMER

52T060191-5

C-BAND TEST ANTENNA

52T060231

BATTERY CART

52T060232

CABLE

58T060001

F/M TELEMETRY GROUND STA.

58T060014

ADAPT CABLE

58T060023

LATCH RLYS RESET & MONITOR ASS'Y

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PAGE 104REPORT E217MODEL 195B**2.4.10 VIBRATION TEST (UNMANNED VEHICLE GBQ #1 ONLY) - STDR B5-H92
(CONTINUED)****(D) AGE REQUIRED (CONTINUED)**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
58D202037	CABLES
58324-5	CABLE
RACKS 327, 328, 329	COMMUNICATION VSWR CART
REMOTE C-BAND BEACON INTERROGATION RACK (R326)	
ASSORTED ATTENUATORS, COAX CABLES, FITTINGS, AND VHF	
TEST ANTENNAS.	

(E) TEST OUTLINE

- (1) SPACECRAFT INSTALLED IN A VERTICAL POSITION ON THE HORIZONTAL VIBRATION FIXTURE AT SPACECRAFT/LAB ATTACH POINTS. HORIZONTAL FIXTURE ALLOWS FOR VIBRATION OF S/C IN THE TWO HORIZONTAL AXIS.
- (2) PYRO SIMULATOR VERIFICATION
- (3) CONDUCT LOW-LEVEL SINUSOIDAL VIBRATION AS FOLLOWS:

<u>FREQUENCY</u>	<u>LEVEL</u>
5 - 50 Hz	<u>±</u> 0.1 G
50 - 90 Hz	<u>±</u> 0.5 G
90 - 500 Hz	<u>±</u> 1.0 G

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2.4.10 VIBRATION TEST (UNMANNED VEHICLE GBQ #1 ONLY) - STDR B3-H92
(CONTINUED)

(E) TEST OUTLINE (CONTINUED)

- (4) PERFORM EQUALIZATION RUN AND ADJUST FILTER EQUALIZER TO OBTAIN PROPER FREQUENCY SPECTRAL DENSITY.
- (5) POWER-UP S/C AND EVALUATE SYSTEM OPERATION VIA TM.
- (6) CONDUCT ONE-MINUTE RANDOM VIBRATION AT 7.4 GRMS FROM 20 TO 2000 Hz.
- (7) RECORD AMBIENT DATA FOR ONE MINUTE AFTER COMPLETING RUN.
- (8) POWER-DOWN S/C AND REMOVE ANALOG T/R AND EVALUATE DATA.
- (9) PYRO SIMULATOR VERIFICATION
- (10) INSTALL S/C IN VERTICAL POSITION ON THE VERTICAL VIBRATION FIXTURE AT SPACECRAFT/LAB ATTACH POINTS.
- (11) CONDUCT LOW-LEVEL HAND PROBE READOUT (SAME AS ITEM E3)
- (12) PERFORM EQUALIZATION RUN AND ADJUST FILTER EQUALIZER TO OBTAIN PROPER FREQUENCY SPECTRAL DENSITY.
- (13) PYRO SIMULATOR VERIFICATION
- (14) POWER-UP S/C AND EVALUATE SYSTEMS OPERATIONS.
- (15) CONDUCT ONE-MINUTE RANDOM VIBRATION AT 7.4 GRMS FROM 20 TO 2000 Hz.
- (16) RECORD AMBIENT DATA FOR ONE MINUTE AFTER COMPLETING RUN.
- (17) MAKE PLAYBACK OF PCM T/R
- (18) POWER-DOWN S/C REMOVE ANALOG T/R, CAMERA AND EVALUATE DATA.
- (19) PYRO SIMULATOR VERIFICATION

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2.4.10 VIBRATION TEST (UNMANNED VEHICLE GBQ #1 ONLY - STDR B3-H92) (CONTINUED)

(E) TEST OUTLINE (CONTINUED)

(20) REMOVE S/C FROM VIBRATION FIXTURE.

(21) AFTER VIBRATION PERFORM FOLLOWING COAXIAL CABLE

VSWR MEASUREMENT PER STDR B3-E42:

(A) FROM TM XMTR TO NOSE STUB ANTENNA AND
DESCENT ANTENNA.

(B) FROM RECOVERY BEACON TO RECOVERY ANTENNA
AND NOSE STUB ANTENNA.

(C) FROM VHF T/R #1 AND VHF T/R #2 TO NOSE STUB
ANTENNA AND DESCENT ANTENNA.

(D) FROM HF T/R TO HF WHIP ANTENNA.

(E) FROM C-BAND BEACON TO C-BAND BEACON ANTENNA
SYSTEM.

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2.5 MISCELLANEOUS PROCEDURES

CERTAIN OTHER PROCEDURES WILL BE PROVIDED THAT ARE CONSIDERED IN A SUPPORT CAPACITY IN THEIR APPLICATION TO THE OVERALL TEST OUTLINE. THESE STDR'S ARE COVERED IN THE FOLLOWING SUB-PARAGRAPHS SINCE MOST OF THEM INVOLVE OPERATIONS NOT SPECIFICALLY AFFECTING TEST PHILOSOPHY OR OBJECTIVES.

2.5.1 SPACECRAFT MATING AND DEMATING PROCEDURES - STDR B3-E204

(A) MATING AND DEMATING PROCEDURES FOR:

- (1) RCS SECTION TO CABIN
- (2) RECOVERY SECTION TO RCS SECTION
- (3) CABIN TO ADAPTER
- (4) NOSE FAIRING INSTALLATION

2.5.2 PREPARATION FOR SHIPMENT - STDR B3-H208

- #### (A) THIS STDR PROVIDES DETAILED CHECK LISTS FOR PREPARING THE SPACECRAFT FOR SHIPMENT. CHECKLISTS ARE PROVIDED FOR EACH SPACECRAFT MODULE TO VERIFY INTERFACE WIRE BUNDLES ARE COVERED, FREE WIRE BUNDLES ARE COVERED, ACTIVE BATTERIES ARE NOT INSTALLED, HATCHES ARE CLOSED, SHINGLES INSTALLED, ACCESS DOORS INSTALLED AS REQUIRED, TCS NOZZLE DUST PLUGS INSTALLED, COOLANT SYSTEM SERVICED, RCS SYSTEM PADDED, ETC. AND S/C TUMBLED.

2.5.3 SPACECRAFT HANDLING PROCEDURES - STDR B3-E203

- (A) GENERAL HANDLING PROCEDURES
- (B) RECOVERY SECTION HANDLING

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2.5.3 SPACECRAFT HANDLING PROCEDURES - STDR B3-E203 (CONTINUED)

- (C) RCS SECTION HANDLING
- (D) CABIN SECTION HANDLING
- (E) HEAT SHIELD HANDLING
- (F) ADAPTER HANDLING
- (G) ADAPTER HANDLING ON WEIGHING AND CENTER OF GRAVITY INDEXING FIXTURE.
- (H) RE-ENTRY MODULE HANDLING ON WEIGHING AND CENTER OF GRAVITY INDEXING FIXTURE.
- (I) SPACECRAFT HANDLING
- (J) RE-ENTRY MODULE HANDLING ON SPACECRAFT DOLLY.
- (K) RE-ENTRY MODULE HANDLING ON RE-ENTRY MODULE HANDLING DOLLY.
- (L) SPACECRAFT HANDLING ON VERTICAL TRANSPORTATION TRAILER.
- (M) SPACECRAFT HANDLING ON HORIZONTAL TRANSPORTATION TRAILER.
- (N) SPACECRAFT LOADING IN AIRCRAFT.
- (O) SPACECRAFT HANDLING LIMITATIONS.

2.5.4 SPACECRAFT RIGGING AND ALIGNMENT - STDR B3-E201

- (A) THIS STDR PROVIDES INSTRUCTIONS FOR RCS/RECOVERY SECTION SHINGLE INSTALLATION, HEAT SHIELD HATCH ALIGNMENT, RIGGING OF EJECTION SEATS AND INSTALLATION, AND OPERATIONAL CHECKOUT PROCEDURES.

2.5.5 SPACECRAFT TEST POINT LIST - STDR B3-1

- (A) THIS STDR PROVIDES A LISTING OF SPACECRAFT TEST POINTS, SIGNALS, USAGE AND REFERENCE DRAWINGS.

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2.5.6 SPACECRAFT CABLING HOOK-UP BY STDR IMAGE - STDR B3-H205

- (A) THIS STDR ESTABLISHES THE INITIAL CABLING REQUIREMENTS FOR EACH TEST STDR, UNLESS REQUIREMENTS ARE SPECIFIED IN THE TEST STDR.

2.5.7 COMPLEX VALIDATION - STDR B5-3

- (A) THIS TEST SHALL FUNCTIONALLY VERIFY ALL COMPLEX SIGNAL PATHS AS WELL AS OPERATION OF THE AGE END ITEMS.
(EXCEPT G & C SIGNALS).

2.5.8 COMPLEX VALIDATION (G & C SIMULATOR) - STDR B5-4

- (A) THESE PROCEDURES ARE UTILIZED FOR PERFORMING VALIDATION TESTS OF THE GUIDANCE AND CONTROL COMPLEX CABLING ALONG WITH A FUNCTIONAL TEST OF THE G & C AGE EQUIPMENT.

2.5.9 SPACECRAFT SERVICING - STDR B3-E206

- (A) THIS STDR PROVIDES COOLANT SERVICING AND DESERVICING PROCEDURES, WATER SERVICING AND DESERVICING, PRIMARY O₂, SECONDARY O₂ ANALOG TAPE RECORDER AND CAMERA SERVICING PROCEDURES. ALSO INCLUDES RCS DESERVICING AND PADDING.

2.5.10 SPACECRAFT ALIGNMENT - STDR B3-H200

- (A) THIS PROCEDURE ALIGNS THE OPTICAL SIGHT AND ACCELEROMETERS WITH THE INERTIAL PLATFORM MOUNTING BASE (COLD-PLATE). THE OPTICAL SIGHT AND ACCELEROMETERS SHALL BE ALIGNED TO THE SPACECRAFT GEOMETRIC AXIS.